BRITISH COLUMBIA
MINISTRY OF FORESTS

Sunshine Coast Timber Supply Area

Rationale for Allowable Annual Cut (AAC) Determination

Effective January 1, 2002

Larry Pedersen
Chief Forester

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Objective of this document

This document is intended to provide an accounting of the factors I have considered and the rationale I have employed as chief forester of British Columbia in making my determination, under Section 8 of the *Forest Act*, of the allowable annual cut (AAC) for the Sunshine Coast Timber Supply Area (TSA). This document also identifies where new or better information is needed for incorporation in future determinations.

Description of the TSA

The Sunshine Coast TSA comprises approximately 1.5 million hectares along the southwest coast of British Columbia. The TSA is administered from the British Columbia Forest Service (BCFS) Sunshine Coast Forest District office in Powell River, as well as a field office in Sechelt. The TSA is bordered by the Fraser TSA to the south, the Soo TSA to the east and the Kingcome TSA to the north. It is also adjacent to Tree Farm Licence (TFL) 10, and portions of TFL 39 and TFL 43.

The landscape of the Sunshine Coast TSA is dominated by the Coast Mountains and several coastal fjords, most notably Bute, Toba and Jervis Inlets. The landscape ranges from nutrient rich, moist floodplains in the valley bottoms to alpine meadows. About 28 percent of the land base of the TSA is considered to be productive forest land managed by the BCFS, and just over 50 percent of this area is considered to be available for timber harvesting.

The forests of the TSA are diverse, and approximately half of the forests on the land base contributing to timber supply are considered to have medium or good site productivity. Major tree species include Douglas-fir, hemlock and subalpine fir (balsam), while other species such as western redcedar, spruce, pine, alder, and cottonwood also occur. The forests of the TSA have a long harvesting history, and as a result there are rapidly maturing second-growth forests on the lower elevation, more accessible and higher productivity growing sites. Nearly half of the stands on the timber harvesting land base are between 21 and 100 years of age.

According to the 1996 census, the population of the TSA is 45 878 persons, more than half of which live in the communities of Powell River, Sechelt and Gibsons. Other smaller communities within the TSA include Halfmoon Bay, Pender Harbour and Lund, as well as communities on Texada, Cortes and Lasqueti Islands.

History of the AAC

The Sunshine Coast TSA was established in 1986 with an AAC of 1 429 580 cubic metres. The AAC was temporarily increased in 1989 by 16 000 cubic metres to facilitate harvesting of deciduous species in a Forest Licence that had been awarded for that purpose.

Effective January 1993, the AAC was reduced by 24 percent to 1 100 000 cubic metres, due primarily to a smaller timber harvesting land base than estimated in the 1986 analysis. Among other things, the new timber harvesting land base was based on improved estimates of operability and improved accounting for non-timber resource values such as wildlife habitat, visual aesthetics, fish habitat and old growth retention.

In 1996, the chief forester determined the AAC to be 1 140 000 cubic metres, a 3.6 percent increase from the 1993 level. This AAC included a 5 percent reduction in the harvest level attributable to coniferous stands, and a 95 000 cubic metre partition to red alder stands with a deciduous component greater than 50 percent. That level remains in effect today and is currently apportioned by the Minister of Forests as follows:

Apportionment	Cubic metres/year	Percentage
Forest Licences – replaceable (5)	831 598	73
Forest Licences – nonreplaceable	95 000	8
Timber Sale Licence, less than or equal to 10 000 m^3, replaceable	36 416	3
SBFEP any category	77 692	7
SBFEP bid proposal	78 574	7
Forest Service Reserve	10 720	1
Woodlot licences	10 000	1
Total	**1 140 000**	**100.0**

New AAC determination

Effective January 1, 2002 the new AAC for the Sunshine Coast TSA will be 1 143 000 cubic metres. This harvest level includes a partition of 95 000 cubic metres per year to red alder-leading stands with at least 50 percent deciduous by volume, and a further 3000 cubic metres per year to other deciduous-leading stands. This AAC excludes all volume issued to woodlot licences since the 1996 determination.

This AAC will remain in effect until a new AAC is determined, which must take place within five years of this determination.

Information sources used in the AAC determination

Information considered in determining the AAC for the Sunshine Coast TSA include the following:

- *Sunshine Coast TSA Data Package and Information Report*, BCFS, May 2001;
- *Sunshine Coast TSA Analysis Report and Public Discussion Paper*, BCFS, June 2001;
- *Sunshine Coast TSA Summary of Public Input on Data Package and TSA Analysis Report*, BCFS, December 2001;
- Letter from the Minister of Forests to the chief forester, dated July 28, 1994, stating the Crown's economic and social objectives for the province;
- Memorandum from the Minister of Forests to the chief forester, dated February 26, 1996, stating the Crown's economic and social objectives for the province regarding visual resources;

- Technical review and evaluation of current operating conditions through comprehensive discussions with staff of the BCFS, including the AAC determination meeting held in Powell River, October 15, 16 and 17, 2001;
- *Sunshine Coast TSA Rationale for AAC determination*, BCFS, July, 1996;
- *Sunshine Coast TSA Timber Supply Analysis*, BCFS, October 1995;
- *Sunshine Coast TSA Socio-Economic Analysis*, Crane Management Consultants, October 1995;
- *Forest Practices Code of British Columbia Act*, consolidated to March 2001;
- *Forest Practices Code of British Columbia Act* Regulations and Amendments, current as of March 2001;
- Forest Practices Code of British Columbia Guidebooks, BCFS and MELP;
- *Sunshine Coast Forest District, Documentation of Vegetation Resources Inventory Preliminary Analysis.* Province of British Columbia, Victoria, B.C. December 14, 2000. Revised February 8, 2001;
- *Site index adjustments for old-growth stands based on veteran trees.* Working Paper # 36, G. Nigh. BCFS Research Branch, Victoria, B.C., 1998;
- *Site index adjustments for old-growth stands based on paired plots.* Working Paper # 37, A. Nussbaum. BCFS Research Branch, Victoria, B.C., 1998;
- Letter to all licensees and summary sheets, addressing amended scenic area and VQOs by mapsheet and polygon for the district. Hemphill, G., Sunshine Coast Forest District. June 22, 1999;
- *Sunshine Coast Forest District Changes in VQO.* Rebantad, B. 1996;
- *Small Business Forest Enterprise Program Community Interface Plan.* BCFS Sunshine Coast Forest District, Powell River, B.C., February 9, 2001;.
- *Sunshine Coast Forest District, Vegetation Resources Inventory Preliminary Analysis.* BCFS Resources Inventory Branch, Victoria, B.C. December 14, 2000. Revised: February 8, 2001;
- *Vegetation Resources Inventory, Implementation Strategy to Integrate Management, Provincial and National Inventories.* BCFS, Resource Inventory Branch, Victoria, B.C. July 2, 1998;
- *Managing Visual Resources to Mitigate Impacts on Timber Supply in the Vancouver Forest Region: The Final Report (2nd Edition).* BCFS, Vancouver Forest Region, February 11, 1999;
- *Regional Landscape Unit Planning Strategy*, BCFS, Vancouver Forest Region, July 2, 1999;
- *Report on Archaeological Inventory in the Vancouver, Theodosia, Brem and Homathko River Watersheds,* Sunshine Coast Forest District (Heritage Conservation Act Permit 1998-046). Golder Associates Ltd. April, 1999;
- *Coastal Watershed Assessment Procedure Guidebook (CWAP). Interior Watershed Assessment Procedure Guidebook (IWMP), Second Edition.* Province of British Columbia, Victoria, B.C., April 1999;
- *Forest Practices Code Timber Supply Analysis*, 1996;

- *Identified Wildlife Management Strategy*, February 1999;
- *Landscape Unit Planning Guide*, BCFS and MELP, March 1999;
- *Higher Level Plans: Policy and Procedures*, BCFS and MELP, December 1996.

Role and limitations of the technical information used

Section 8 of the *Forest Act* requires the chief forester to consider biophysical as well as social and economic information in AAC determinations. A timber supply analysis, and the inventory and growth and yield data used as inputs to the analysis, typically form the major body of technical information used in AAC determinations. Timber supply analyses and associated inventory information are concerned primarily with biophysical factors—such as the rate of timber growth and definition of the land base considered available for timber harvesting—and with management practices.

However, the analytical techniques used to assess timber supply are necessarily simplifications of the real world. There is uncertainty about many of the factors used as inputs to timber supply analysis due in part to variations in physical, biological and social conditions, although ongoing science-based improvements in the understanding of ecological dynamics will help reduce some of this uncertainty.

Furthermore, technical analytical methods such as computer models cannot incorporate all of the social, cultural and economic factors that are relevant when making forest management decisions. Therefore, technical information and analysis do not necessarily provide complete answers or solutions to forest management problems such as AAC determinations. The information does, however, provide valuable insight into potential impacts of different resource-use assumptions and actions, and thus forms an important component of the information required to be considered in AAC determinations.

In determining the AAC for the Sunshine Coast TSA, I have considered known limitations of the technical information provided, and I am satisfied that the information provides a suitable basis for my determination.

Statutory framework

Section 8 of the *Forest Act* requires the chief forester to consider particular factors in determining AACs for TSAs and TFLs. Section 8 is reproduced in full as Appendix 1.

Guiding principles for AAC determinations

Rapid changes in social values and in our understanding and management of complex forest ecosystems mean that there is always some uncertainty in the information used in AAC determinations. In making a large number of determinations for many forest management units over extended periods of time, administrative fairness requires consistency when addressing these changes and associated uncertainties. To make my approach in these matters explicit, I have set out the following body of guiding principles. If in some specific circumstance it is necessary to deviate from these principles, I will provide a detailed reasoning in the considerations that follow.

Two important ways of dealing with uncertainty are:

(i) minimizing risk, in respect of which in making AAC determinations, I consider the uncertainty associated with the information before me, and attempt to assess the various potential current and future social, economic and environmental risks associated with a range of possible AACs; and

(ii) redetermining AACs frequently, to ensure they incorporate current information and knowledge—a principle that has been recognized in the legislated requirement to redetermine AACs every five years. The adoption of this principle is central to many of the guiding principles that follow.

In considering the various factors that Section 8 of the *Forest Act* requires me to take into account in determining AACs, I attempt to reflect as closely as possible operability and forest management factors that are a reasonable extrapolation from current practices. It is not appropriate to base my decision on unsupported speculation with respect either to factors that could work to increase the timber supply—such as optimistic assumptions about harvesting in unconventional areas, or using unconventional technology, that are not substantiated by demonstrated performance—or to factors that could work to reduce the timber supply, such as integrated resource management objectives beyond those articulated in current planning guidelines or the *Forest Practices Code of British Columbia Act* and its associated regulations (the Forest Practices Code).

The *Forest Practices Code of British Columbia Regulations* were originally approved by the Lieutenant Governor in Council on April 12, 1995, and released to the public at that time. The *Forest Practices Code of British Columbia Act* was brought into force on June 15, 1995.

Although the Forest Practices Code has been fully implemented since the end of the transition period on June 15, 1997, the timber supply implications of some of its provisions, such as those for landscape-level biodiversity, still remain uncertain, particularly when considered in combination with other factors. In each AAC determination I take this uncertainty into account to the extent possible in context of the best available information.

The eventual timber supply impacts associated with strategic land-use decisions resulting from the various planning processes—including the Commission on Resources and Environment (CORE) process for regional plans, the Protected Areas Strategy, and Land and Resource Management Planning (LRMP) process—are often discussed in relation to current AAC determinations. Since the outcomes of these planning processes are subject to significant uncertainty before formal approval by government, it has been and continues to be my position that in determining AACs it would be inappropriate to attempt to speculate on the timber supply impacts that will eventually result from land-use decisions not yet taken by government. Thus I do not account for possible impacts of existing or anticipated recommendations made by such planning processes, nor do I attempt to anticipate any action the government could take in response to such recommendations.

Moreover, even where government has made a formal land-use decision, it may not always be possible to fully analyze and account for the consequent timber supply impacts in a current AAC determination. In many cases, government's land-use decision must be followed by a number of detailed implementation decisions. For example, a land-use

decision may require the establishment of resource management zones and resource management objectives and strategies for these zones. Until such implementation decisions are made it would be impossible to fully assess the overall impacts of the land-use decision. Nevertheless, the legislated requirement for five-year AAC reviews will ensure that future determinations address ongoing plan implementation decisions.

However, where specific protected areas have been designated by legislation or by order in council, these areas are deducted from the timber harvesting land base and are no longer considered to contribute to the timber supply in AAC determinations.

Forest Renewal British Columbia (FRBC) has funded a number of intensive silviculture activities that have the potential to affect timber supply, particularly in the long-term. As with all components of my determinations, I require sound evidence before accounting for the effects of intensive silviculture on possible harvest levels. Nonetheless, I will consider information on the types and extent of planned and implemented practices as well as relevant scientific, empirical and analytical evidence on the likely magnitude and timing of any timber supply effects of intensive silviculture.

Some have suggested that, given the large uncertainties present with respect to much of the data in AAC determinations, any adjustments in AAC should wait until better data are available. I agree that some data are not complete, but this will always be true where information is constantly evolving and management issues are changing. Moreover, in the past, waiting for improved data created the extensive delays that resulted in the urgency to redetermine many outdated AACs between 1992 and 1996. In any case, the data and models available today are improved from those available in the past, and will undoubtedly provide for more reliable determinations.

Others have suggested that, in view of data uncertainties, I should immediately reduce some AACs in the interest of caution. However, any AAC determination I make must be the result of applying my judgement to the available information, taking any uncertainties into account. Given the large impacts that AAC determinations can have on communities, no responsible AAC determination can be made solely on the basis of a response to uncertainty. Nevertheless, in making my determination, I may need to make allowances for risks that arise because of uncertainty.

With respect to First Nations' issues, I am aware of the Crown's legal obligations resulting from recent court decisions including those in the Supreme Court of Canada. The AAC that I determine should not in any way be construed as limiting those obligations under these decisions, and in this respect it should be noted that my determination does not prescribe a particular plan of harvesting activity within the Sunshine Coast TSA. It is also independent of any decision by the Minister of Forests with respect to subsequent allocation of the wood supply.

With respect to future treaty decisions, as with other land-use decisions it would be inappropriate for me to attempt to speculate on the impacts on timber supply that will result from decisions that have not yet been taken by government. I am aware that seven First Nations have asserted traditional territory within the Sunshine Coast TSA. Any decisions on treaty negotiations with the First Nations that are undertaken by government will be reflected in future AAC determinations for the TSA.

Overall, in making AAC determinations, I am mindful of the mandate of the Ministry of Forests as set out in Section 4 of the *Ministry of Forests Act* and of my responsibilities under the *Forest Practices Code of British Columbia Act* and the *Forest Act*.

The role of the timber supply analysis

In considering the factors required under Section 8 of the *Forest Act* to be addressed in AAC determinations, I am assisted by timber supply forecasts provided to me through the timber supply review process.

For each AAC determination for a TSA, a timber supply analysis is carried out using an information package including data and information from three categories—land base inventory, timber growth and yield, and management practices. Using this set of data and a computer model (Forest Stand Simulator, or FSSIM), a series of timber supply forecasts is produced, reflecting different starting harvest levels, rates of change over time, and potential trade-offs between short- and long-term harvest levels.

From this range of forecasts, one is chosen which attempts to avoid excessive changes from decade to decade and significant timber shortages in the future, while ensuring the long-term productivity of forest lands. This is known as the 'base case' forecast, and forms the basis for comparison when assessing the effects of uncertainty on timber supply.

Because it represents only one in a number of theoretical forecasts, and because it incorporates information about which there may be some uncertainty, the base case forecast for a TSA is not an AAC recommendation. Rather, it is one possible forecast of timber supply, whose validity—as with all the other forecasts provided—depends on the validity of the data and assumptions incorporated into the computer simulation used to generate it.

Therefore, much of what follows in the considerations outlined below is an examination of the degree to which all the assumptions made in generating the base case forecast are realistic and current, and the degree to which its predictions of timber supply must be adjusted, if necessary, to more properly reflect the current situation.

These adjustments are made on the basis of informed judgement, using current available information about forest management, which may well have changed since the original information package was assembled. Forest management data is particularly subject to change during periods of legislative or regulatory change, such as the enactment of the Code, or during the implementation of new policies, procedures, guidelines or plans.

Thus it is important to remember, in reviewing the considerations which lead to the AAC determination, that while the timber supply analysis with which I am provided is integral to those considerations, the AAC determination itself is not a calculation but a synthesis of judgement and analysis in which numerous risks and uncertainties are weighed. Depending upon the outcome of these considerations, the AAC determined may or may not coincide with the base case forecast. Judgements that may be based in part on uncertain information are essentially qualitative in nature and, as such, are subject to an element of risk. Consequently, once an AAC has been determined, no additional precision or validation may be gained by attempting a computer analysis of the combined considerations to confirm the exact AAC determined.

Reference forecasts for the Sunshine Coast TSA

The reference harvest forecasts presented in the *June 2001 Sunshine Coast Timber Supply Area Analysis Report* incorporated the most current available information on forest management, land base and timber yields for the TSA. The forecasts included specific assumptions about the TSA that are discussed in detail in the analysis report.

In this rationale, I will discuss many of those analysis assumptions in the context of my considerations for this AAC determination. However, where my review of an assumption has concluded that I am satisfied it was appropriately modelled in the base case of the timber supply analysis, I will not discuss my considerations in detail in this document, other than to note my agreement with the approach that is already documented in the timber supply analysis report. Some factors for which the assumptions were appropriately modelled in the analysis may warrant discussion, however, for other reasons, such as a high level of public input, lack of clarity in the analysis report, or concerns resulting from the previous determination for the Sunshine Coast TSA. As a result, I may choose to provide my consideration of such factors in this rationale.

Two harvest forecasts were developed for the Sunshine Coast TSA based on factors appropriate to the TSA and these were made available for public review and comment. The first harvest forecast projected a maximum even-flow harvest level of 1 233 000 cubic metres per year which could be maintained without decline for the entire forecast period. This harvest level is about 8 percent above the level of the current AAC for the Sunshine Coast TSA, and illustrates the maximum long-term level that can be maintained without incurring future timber supply reductions.

For additional reference, a second harvest forecast was projected at the level of the current AAC, which indicated that the harvest level of 1 140 000 cubic metres per year could be maintained without decline for the entire forecast period.

Several specific assumptions applicable to both reference forecasts are as follows:

- The volume contribution from red alder-leading stands (greater than 50 percent deciduous by volume with red alder as the leading deciduous species) to the harvest level was maintained at 95 000 cubic metres per year for the first 40 years. The contribution then decreased to 85 000 cubic metres per year for one decade, and declined to zero after 50 years. This assumption is discussed further under *deciduous stands*.
- The volume contribution to the harvest level from other deciduous-leading stands was limited to a maximum of 2800 cubic metres per year. This level was estimated to be the long-term harvest level from these stands. This assumption is also discussed under *deciduous stands*.
- The volume contribution from existing stands older than 250 years of age was limited to 40 percent of the total harvest level for the TSA. This constraint is discussed further under Harvest profile.

I am aware that the reference harvest forecasts for the 2001 timber supply analysis differ significantly from the base case harvest forecast in the 1995 analysis. In the 1995 analysis, the base case forecast indicated that the initial harvest level of 1 100 000 cubic metres

per year could be maintained for one decade before declining at a rate of 10 percent per decade for the second and third decades. The harvest rate then remained at this level for the next 130 years before increasing to a long term level of 986 000 cubic metres per year.

As part of the 2001 analysis, as published in the *June 2001 Sunshine Coast TSA Timber Supply Analysis Report*, a comparison was made between the assumptions for the two timber supply analyses. The reference forecasts in the 2001 analysis indicate a much more stable timber supply than was projected during the previous timber supply review. Three main factors contribute largely to the differences in the harvest flows, as follows:

- changes in the assumptions regarding visually sensitive areas;
- changes to the inventory data (ages, and heights) as a result of the use of data from phase two of the vegetation resources inventory (VRI); and
- the addition of 10 500 hectares of alder-leading stands, and 2600 hectares of other deciduous-leading stands to the timber harvesting land base.

My considerations of these factors are discussed later in this rationale.

There were specific considerations consistent with current timber supply review policies which led to the choice of the 2001 reference forecasts. These considerations centred around the long-term stabilization of the growing stock on the timber harvesting land base. The alternative harvest forecasts that were considered are discussed later in this document.

I have considered the reasoning used to select the reference harvest forecasts. I have also considered the differences between the maximum even flow forecast, and the one in which the level of the current AAC was projected to be maintained. I note that the primary difference between these two forecasts is that, in the forecast projecting the lower harvest level, the quantity of growing stock on the timber harvesting land base continues to increase over the analysis horizon and beyond. In the maximum even flow harvest forecast, the growing stock remains relatively constant after the tenth decade and does not continue to increase. The maximum even flow harvest forecast provides a better assessment of the available timber supply under current management constraints, and I am satisfied that it provides a suitable basis from which to evaluate the assumptions regarding land base, management practices and timber yields for the Sunshine Coast TSA.

I have also considered all public input received on the data package and analysis report, and where appropriate I discuss these in my considerations under the various factors presented in this rationale.

Consideration of Factors as Required by Section 8 of the *Forest Act*

Section 8 (8)

In determining an allowable annual cut under subsection (1) the chief forester, despite anything to the contrary in an agreement listed in section 12, must consider

(b) the rate of timber production that may be sustained on the area, taking into account

(ii) the composition of the forest and its expected rate of growth on the area,

Land base contributing to timber harvesting

- general comments

As part of the process used to define the timber harvesting land base in the timber supply analysis, a series of deductions are made from the productive forest land base. These deductions account for the factors that effectively reduce the suitability or availability of the productive forest area for harvest, for ecological, economic or social reasons. The deductions in the Sunshine Coast TSA timber supply analysis resulted in a timber harvesting land base of 223 806 hectares.

I have considered all of the deductions applied in the derivation of the timber harvesting land base for the Sunshine Coast TSA. Those assumptions related to factors associated with the derivation of the timber harvesting land base for which, based on my thorough review, I accept the assumptions applied in the analysis are not discussed below. These factors include the accounting in the analysis for gullies and timber licences.

Where my consideration of the information has identified a factor which in my estimation requires discussion in this document, it is described below.

- economic and physical operability

Those portions of the TSA which are neither physically operable nor economically feasible to harvest are categorized as inoperable, and are excluded when deriving the timber harvesting land base.

Operability lines were developed for the Sunshine Coast TSA in 1993. Major licensees reviewed and updated the mapping for their chart areas in 1998, and the mapping was reviewed by district staff. Staff indicate that few changes were made to the lines at that time.

Since then, a number of licensees' forest development plans (FDPs) have shown proposed cutblocks above the 1998 operability lines. However, district staff indicate that the practicality of harvesting many of these proposed blocks is uncertain.

Staff also note that more areas are prescribed for helicopter harvesting, and that licensees have exhibited strong performance in helicopter operable areas.

Staff note that operability lines have become the source of significant resource management conflict in the TSA, largely related to landscape unit planning and implementation of the Identified Wildlife Management Strategy (IWMS). The *Landscape Unit Planning Guide* specifies that old growth targets are to be first met to the extent possible from the non-contributing land base. Some have interpreted this policy guidance to mean that proposals

for the reservation of old growth outside the timber harvesting land base cannot be compromised by forest development proposals.

Public input from the Sunshine Coast Conservation Association stated that subsidized helicopter logging in inoperable areas highlights the fact that economically feasible short-term timber supply is extremely limited, and raises the question of how many cutblocks are located in non-contributing forest in order to maintain the AAC.

I have considered this input and the interpretation of the policy direction in the *Landscape Unit Planning Guide* that is mentioned above. I am satisfied that the intent of the policy in the guide is not to prevent increases in the size of the operable land base that appropriately reflect technological and market changes, as well as are reflective of current practice.

In response to the comments on helicopter logging, I agree that pricing policies in combination with market fluctuations indeed will work to either expand or restrict what can be defined as economically accessible areas. However, the purpose of defining an operable land base is to reasonably describe the land base expected to be physically and economically available for timber harvesting based on licensee performance over the term of the current AAC. The size of this land base is expected to change over time with advances in technology and changes in markets. The defined operable land base is therefore expected to vary over time, but the contributing and non-contributing land bases need to be managed jointly in a manner that meets provincial conservation objectives, such as those for the maintenance of old growth.

To the extent that the non-contributing land base is required to meet conservation objectives, such as the retention of old growth to meet landscape level biodiversity objectives or wildlife habitat objectives, then these areas should be legally established under the appropriate designations to ensure the objectives are met. I have also mentioned this briefly under those sections of this rationale.

For this determination, I am satisfied that the assumptions applied in the analysis for physical and economic operability represent current performance in the TSA, and are based on the best available information. As a result, I make no adjustments on this account.

- environmentally sensitive areas

Environmentally sensitive area (ESA) data—which identify areas sensitive to disturbance due to soil conditions, areas difficult to regenerate and/or with significant value for fisheries, wildlife, water or recreation resources—were used to exclude areas in the derivation of the timber harvesting land base for the Sunshine Coast TSA. ESA classifications of E1 (highly sensitive) or E2 (moderately sensitive) are used to exclude areas from the land base where more specific or detailed information is not available about a particular forest resource.

I have reviewed the exclusions applied to account for environmentally sensitive areas and I am satisfied that the assumptions in the analysis were appropriate. As a result, I will not discuss my considerations in detail in this rationale, with the exception of the reductions applied to account for soils which I feel require some additional explanation.

In the previous determination for the Sunshine Coast TSA, it was suspected that the ESA data used in the analysis may have underestimated the area of unstable soils. In the

2001 analysis, a combination of terrain stability mapping, slope mapping and ESA data was used to identify and exclude areas with sensitive or unstable soils.

For those portions of the TSA where terrain stability mapping had been completed, the data were used in the analysis to estimate exclusions for unstable soils. Using the available data, 100 percent of terrain class V and 30 percent of terrain class IV areas were excluded in the derivation of the timber harvesting land base.

For other portions of the TSA, mapping of areas with greater than 60 percent slope was available, and this mapping was used in the analysis to identify and estimate exclusions. For these areas, about one third of the areas with slopes greater than 60 percent were excluded.

Some portions of the TSA had neither terrain stability nor slope mapping completed. For those portions of the land base, the older ESA data were used to determine appropriate exclusions.

In total, 27 558 hectares were excluded based on slope and terrain class data, and a further 3390 hectares using the ESA data for sensitive soils. Overall, the area excluded to account for unstable soils is greater than in the previous timber supply review.

Public input from the Cortes Ecoforestry Society and the Klahoose First Nation expressed concern about additions to the operable land base in higher elevation terrain, given the regeneration problems in these areas and concerns about hydrological impacts. With respect to the first point, I note that areas classified in the ESA data as having significant regeneration problems (Ep1 and Ep2) were 100 percent excluded in the analysis, for a total of 1500 hectares. Further, I note that for the community watershed areas where hydrological considerations are paramount, constraints were applied in the analysis to account for the management requirements, as discussed under that section of this rationale.

The Cortes Ecoforestry Society also expressed the opinion that the terrain classification was not completed at a sufficient level of resolution. The society indicated that the more detailed mapping it conducted indicated many more rock outcrops than shown by the BCFS data. However, BCFS staff note that the existing stand yield estimates, which were adjusted based on the results of the Vegetation Resources Inventory ground sampling, account for small non-forest areas such as rock outcrops. Operational adjustments factors are used in projecting regenerated stand yields to account for the same.

I note that collecting data to the degree of resolution suggested by the Cortes Ecoforestry Society is cost prohibitive for timber supply review purposes, particularly in light of the fact that accounting for rocky outcrops and other non-productive sites does occur in the estimates of both existing and future stand yields. I am satisfied that there is no need to make an adjustment on this account for this determination.

I have reviewed the information about the accounting in the analysis for unstable and sensitive soils, and I conclude that the reduction factors applied in the analysis are reasonable. The use of the combined terrain stability, slope mapping and ESA data has resulted in an increase in the amount of area excluded from the timber harvesting land base relative to the previous analysis. I believe the exclusions to be appropriate given the type of terrain prevalent in the Sunshine Coast TSA, and I make no further adjustments for this determination.

- non-merchantable forest types

Stands that are physically operable and exceed low site criteria yet are not currently utilized because of low timber quality or volume are referred to as problem forest types. Obviously, this definition is based on economic criteria, for the purpose of defining the net operable land base. It does not imply that these types of forests are not important in terms of their role and function in the ecosystem.

In the analysis for the Sunshine Coast TSA, non-merchantable stands were characterized as those existing stands with volumes of less than 300 cubic metres per hectare, or regenerated stands growing on sites with such low site indices that they could not achieve 300 cubic metres per hectare by 150 years of age. A total of 16 223 hectares were excluded in the derivation of the timber harvesting land base to account for unmerchantable stand types.

The criteria used to exclude non-merchantable forest types were the same as those used in the previous timber supply review for the TSA. However, in the previous analysis for the TSA, a total of 39 963 hectares were excluded to account for non-merchantable and low productivity forest types. BCFS staff have reviewed the differences, and note that the 39 963 hectares included over 12 000 hectares of deciduous forest types, which as discussed under that section of this rationale were not excluded in the 2001 timber supply analysis. With regard to the remaining difference of about 11 700 hectares, staff indicate that many of the remaining stands would have been excluded through the accounting for other resources, such as the exclusions applied for protected areas established since the previous determination, unstable terrain and riparian areas. In addition, stand volumes were adjusted in the inventory file (as discussed *under volume estimates for existing stands*) for the 2001 analysis, which would have resulted in some stands previously considered non-merchantable to meet the minimum volume thresholds.

District staff indicate that the criteria upon which the exclusions were based are reflective of limitations in current harvesting in the Sunshine Coast TSA.

Public input received from the Tuwanek Ratepayer's Association expressed concern that the low site index cutoffs would result in less forested area available to meet biodiversity or other needs. I have considered this input, and I note that the criteria used are reflective of current operations. It would be inappropriate to artificially constrain timber supply by imposing a limit that is not reflective of what is harvestable operationally. However, I also note that there are other provisions in the analysis to ensure that the maintenance of biodiversity and other values is reflected in the projections of available timber supply.

Additional input received from the same association expressed concern that previously harvested areas regardless of site index remained in the timber harvesting land base. In particular, the concern related to low productivity sites in the high elevation Mountain Hemlock (MH) biogeoclimatic zone.

As I have mentioned in other rationales for units with timber harvesting land base within the MH zone, I am aware of concerns about the success of regeneration of stands on these high elevation, sensitive sites. I would like to make a couple of points which may serve to alleviate this concern. First, district staff note that although 14.7 percent of the *TSA* lies within the MH zone, only about 4.6 percent of the *timber harvesting land base* lies in this

zone. Of the MH zone that occurs within the TSA, about 17.6 percent of the forested area is in the timber harvesting land base. Therefore, not only is the timber supply not largely dependent on the harvest of stands from this zone, but also the majority of the stands in the zone are not within the timber harvesting land base and are unlikely to ever be harvested. Further, BCFS staff have conducted audits of tree growth on the regenerating MH sites in other management units, and have found no data to substantiate the concern that regeneration is a significant problem. Data from the audits indicate that the actual growth achieved by the stands operationally correlates well with expected growth projections for these sites.

Having considered the information about non-merchantable forest types, I am satisfied that the criteria used were an appropriate reflection of current practice and suitable for use in this determination.

With respect to the concerns about the regeneration of stands in the MH biogeoclimatic zone, I encourage district staff to monitor regeneration of any sites harvested in this zone such that any problems can be addressed as they are identified. However, I am satisfied for this determination that no adjustments are required on this account.

- deciduous forest types

Deciduous forest types are those dominated by broad-leaved, deciduous species. Red alder, big leaf maple and black cottonwood are three deciduous species considered to be commercially viable in the Sunshine Coast TSA. All red alder stands with site indices (expressed in metres in height at breast height age 50) greater than 31 metres and other deciduous stands with site indices greater than 35 metres were retained in the derivation of the timber harvesting land base. All other deciduous species are considered to be unmerchantable, and were excluded in the timber supply analysis.

Operationally, a fifteen year non-replaceable Forest Licence (FL) is currently held by Weyerhaeuser Company Limited for the harvest of 95 000 cubic metres per year of red alder stands that are at least 50 percent deciduous by volume.

Stands dominated by the above three deciduous species were grouped into two specific analysis units in the timber supply analysis. Red alder-leading stands that were at least 50 percent deciduous species by volume were grouped into one analysis unit, comprising 10 500 hectares or 4.7 percent of the timber harvesting land base. Cottonwood and maple-leading stands, as well as all other alder-leading stands, were grouped into a second analysis unit comprising 1.2 percent of the timber harvesting land base.

As discussed under Reference Forecasts for the Sunshine Coast TSA, separate harvest flow forecasts were projected for the stands within each analysis unit. The harvest of red alder-leading stands was maintained at 95 000 cubic metres per year for the first forty years of the analysis horizon, after which time it decreased to 85 000 cubic metres per year for one decade, and then to zero for the remainder of the analysis horizon. The harvest level for red alder stands could not be maintained longer than fifty years in the analysis, as the majority of these stands in current practice are regenerated to coniferous stands, and this was reflected in the analysis.

The other deciduous-leading stands contribute up to 2800 cubic metres per year to the total harvest level throughout most of the planning horizon, although less volume is harvested in some decades in the short term.

In my previous determination for the Sunshine Coast TSA, I included an instruction for district staff to refine objectives for reforestation and develop a long term management regime for deciduous-leading stands in the TSA, in cooperation with other stakeholders. An operational trial for red alder management has since been implemented in the Vancouver Forest Region. As part of this trial, 35 hectares of harvested red alder stands may be regenerated to red alder annually in the Sunshine Coast TSA. This represents about 16 percent of the red alder stands that are harvested in the TSA. In the analysis, these stands were modelled to regenerate to the same species (red alder), with the remainder regenerating to coniferous species. BCFS staff expect that a review of the trial will result in further direction on red alder management by the end of 2003.

To assess whether timber supply would be increased or decreased if all red alder stands harvested were regenerated to red alder, a sensitivity analysis was conducted. The results indicate that the regeneration regime would result in a harvest level that is one percent less than that shown in the maximum even flow reference forecast. In the sensitivity analysis, the volume contribution of red alder was shown to be 95 000 cubic metres per year for the first 5 decades, after which it dropped to 80 000 cubic metres per year for the rest of the analysis horizon.

The Tuwanek Ratepayer's Association expressed concern about the biodiversity implications of regenerating alder sites to coniferous species. However, district staff note that red alder also regenerates on areas of high site disturbance, just as it has done historically. In terms of maintenance of plant communities for biodiversity, district staff believe that there are no specific concerns in the TSA.

Input received from Weyerhaeuser expressed concern about the licensees' lack of discretion to reforest sites to red alder. In the licensee's opinion, the long-term viability of the hardwood industry is being affected by the limit of 35 hectares per year under the regional red alder management strategy. The licensee further indicates that it is not sure if the current harvest level of 95 000 cubic metres per year is achievable for the next forty years, reference harvest forecasts notwithstanding.

District staff believe that it is reasonable to expect the rate of harvest of 95 000 cubic metres per year can continue to be achieved for the remainder of the term of the non-replaceable FL. In addition to the non-replaceable FL for red alder in the TSA, a five-year, non-replaceable cottonwood FL is currently being offered in the Southgate River valley portion of the TSA. This FL has a proposed harvest level of 10 000 cubic metres per year from cottonwood-leading stands. Approximately 900 hectares of cottonwood-leading stands were assumed to contribute to timber supply in the analysis. District staff believe that the volume projected to be harvested under this FL is achievable.

Maple-leading stands comprised a further 650 hectares of timber harvesting land base in the analysis. Operationally, additional interest has been expressed by some licensees in the harvest of these stands. However, district staff are uncertain about whether the stands will be economical to harvest. To date, there has been very limited performance in these stands.

In response to Weyerhaeuser's concern about the difficulties associated with the limitation on the use of red alder in reforestation, I have the following comments. I recognize that the licensee has collected a significant amount of data on this topic which would appear to support a higher level of regeneration than is currently allowed for under regional policy. However, BCFS staff are attempting to take a measured approach to reforestation with deciduous species, and as a result the data gathered before the end of 2003 will help to refine a management strategy for the future use of red alder. I expect that the research results will shortly be available upon which to build the appropriate management objectives and regime for this species in the Sunshine Coast TSA. In the meantime, I am satisfied that the analysis has appropriately modelled current practice and I make no adjustments in this regard.

With regard to the concerns expressed about the future availability of red alder-leading stands, I request that district staff continue to work together with the licensee to identify suitable areas for operations, and perhaps better quantify any concerns about the ability to achieve the harvest level assumed in the analysis over time.

In consideration of the assumptions regarding the merchantability of cottonwood, I am satisfied from reviewing the information and discussing it with district staff that the analysis has adequately modelled expected practice for this species. Given that a cottonwood licence is currently offered for 10 000 cubic metres per year for the next 5 years, I accept that there is a demand for this species and a reasonable expectation that the harvesting will occur. The performance in these stands is to be monitored over the term of this determination so that any new information can be incorporated into the next analysis.

With respect to the analysis assumptions regarding the contribution of maple-leading stands, I am less certain that these stands will prove to be economical to harvest. However, some demand has been expressed to harvest these stands in the TSA. At any rate, the area of maple-leading stands is small (650 hectares) and amounts to less than 1 percent of the timber harvesting land base of the TSA. I accept the contribution of these stands in this determination, but again I ask for monitoring so that any additional information can be incorporated into the next analysis.

In this determination, in consideration of the information discussed above, I will maintain the partition to red alder-leading stands, and I will implement a partition to other deciduous-leading stands. I will discuss this further in this rationale under 'Reasons for decision'.

- roads, trails and landings

In the analysis, a percentage of the productive forested area was excluded to account for the permanent loss of productive land to roads, trails and landings. Separate estimates are made for existing and future access structures, to reflect both potential changes in road building practices and road network requirements over time. Estimates account for the area that is permanently removed from the timber harvesting land base.

In the analysis, existing mapped roads and associated rights-of-way were excluded from the timber harvesting land base using a Geographic Information System (GIS). A total of 5238 hectares, or 3.7 percent of the timber harvesting land base covered with stands less than 80 years of age was excluded to account for existing mapped roads, trails and landings.

As discussed under *volume estimates for existing stands*, a reconciliation was done in the analysis to ensure that the volume adjustments made to existing stands as a result of the Vegetation Resources Inventory (VRI) phase II data did not result in a double accounting of the site productivity losses from existing roads.

In order to determine an appropriate accounting for future roads, district staff examined silviculture prescription (SP) data. They derived an estimate that 4.6 percent of the area harvested had been lost from the timber harvesting land base due to site degradation, and this value was applied to stands older than 80 years of age following initial harvest. The total area excluded from the timber harvesting land base to account for future roads, trails and landings was 3916 hectares.

Two licensees noted that the exclusions applied for future roads did not take into account the rehabilitation of forest roads, which will result in lower site productivity losses than in the past. In response, district staff note that road rehabilitation is a recent activity which may not be indicative of future trends. In addition, some staff are uncertain as to whether those growing sites will be restored to full site productivity. However, staff acknowledge that significant efforts have been made to restore approximately 500 hectares of existing road area to forest productivity, and that this rehabilitation was not accounted for in the analysis.

I have considered the accounting in the analysis for both existing and future roads, trails and landings. Overall, I am satisfied that the majority of the analysis assumptions to account for current and future productivity losses were appropriate. I agree that the recent rehabilitation efforts are not necessarily indicative of future trends in this regard, and that monitoring of the rehabilitation is required in order to assess the applicability of adjustments on this account in the future. However, I believe it is reasonable to take into account the restored productivity of sites represented by the past rehabilitation efforts. As a result, I will take into account in this determination an underestimation of 500 hectares in the size of the timber harvesting land base, which affects timber supply in the long term. I will discuss this further under 'Reasons for decision'.

- woodlot licences

The *Forest Act* requires AACs determined for TSAs to be exclusive of the timber supply contribution from areas in woodlot licences. When a woodlot licence is initially issued, the associated harvest level is part of the AAC for the TSA as the woodlot is still part of the TSA. In the subsequent AAC determination for the TSA, the area of Crown land held in woodlot licences and the associated timber supply is excluded from contributing to the AAC for the TSA.

There are 8 issued woodlots in the Sunshine Coast TSA with a total Crown area of 3044 hectares and a total AAC of 18 958 cubic metres per year.

The 1996 AAC determination took into account the area and volume in woodlots issued prior to that determination. In the 2001 analysis, 1400 hectares of area in issued woodlots were excluded from the timber harvesting land base. However, since the analysis was completed, an additional area of 1644 hectares has been issued in woodlots, and this area was not accounted for in the analysis. Further, the total volume of 9159 cubic metres

per year issued to woodlots since the 1996 determination was not deducted from the harvest forecasts in the analysis.

Having considered the information about woodlot licences, I am satisfied that it is appropriate to take into account that timber supply has been overestimated in the reference forecast by 9159 cubic metres per year, or approximately 0.7 percent. My accounting for this will also account for the implications of the additional area now in issued woodlots. I will discuss my considerations of this further under 'Reasons for decision'.

- protected areas

Areas not managed by the BCFS such as parks and protected areas are excluded in the derivation of the timber harvesting land base. All existing parks in the Sunshine Coast TSA were excluded from the timber harvesting land base in the analysis. This includes 14 parks and protected areas established since the previous timber supply review as part of the Lower Mainland Protected Areas Strategy, totalling 11 622 hectares of forested land.

District staff indicate that following the completion of the analysis, an additional area known as Malaspina Park was designated through order-in-council. This park encompasses 461 hectares of timber harvesting land base in the Sunshine Coast TSA.

I have considered the information about protected areas, and I am satisfied that that the majority of the analysis assumptions were appropriate. However, in addition to the areas already excluded in the analysis, I am satisfied it is appropriate to exclude the area associated with Malaspina Park. As a result, I will take into account in this determination the implications to timber supply of excluding an additional 461 hectares, and I will discuss my considerations of this further under 'Reasons for decision'.

Existing forest inventory

The Sunshine Coast TSA was reinventoried between 1991 and 1993. The inventory file has been continually updated to 1999. For the analysis, the forest cover attributes were projected to 2000, as well as the volume depletions due to harvesting.

A Phase I Vegetation Resources Inventory (VRI) was not carried out for the Sunshine Coast TSA because staff were satisfied that due to the recent reinventory, funds would be better spent by initiating a Phase II VRI in the TSA. The Phase II VRI was carried out between 1997 and 1999, involving ground sampling with 70 full plots established across the district, and an additional 120 timber-emphasis plots established in the treed portion of the TSA. The ground samples measured, among other things, the quality and quantity of the timber, coarse woody debris, plants, soils and biogeoclimatic site series. The information was used to adjust ages, heights and volumes of existing stands in the inventory file, based on a statistical comparison of the plot measurements to the previous stand data.

The timber supply implications of using the VRI data in the analysis are discussed further in this section, as follows.

- volume estimates for existing stands

Volumes for existing natural stands (in which species and stocking have not been managed) were estimated and projected using the VRI-adjusted forest inventory attributes and the Variable Density Yield Prediction (VDYP) model which was developed by the BCFS Resources Inventory Branch.

In the analysis, all existing coniferous stands over 21 years of age, and all lodgepole pine-leading and deciduous stands were assumed to be unmanaged, and the volumes for these stands were estimated using VDYP. Following harvest of a stand for the first time in the timber supply model, its future growth and yield is estimated using managed stand yield tables.

As mentioned above, the results of a phase II Vegetation Resources Inventory were used to adjust heights, ages and volumes for existing stands in the TSA. A methodology known as the 'Fraser protocol' (documented in the *Sunshine Coast Forest District – Documentation of Vegetation Resources Inventory Preliminary Analysis*) was used to develop and apply VRI adjustment factors to stand heights, ages and volumes. The goal of the adjustment was to reduce bias in the inventory when compared against the VRI ground samples.

BCFS staff have compared the VRI data to the inventory file attributes, and report that the VRI data suggests the historic forest inventory file underestimated existing stand volumes by about 14 percent. District staff confirm that comparisons of cruised volumes for harvested stands suggest that volumes for existing stands are indeed underestimated by the inventory, in particular for the stands in the Powell Block of the TSA. Overall, district staff believe that the VRI adjustments are reasonable.

Public input from the Sunshine Coast Species Survival Network (SCSSN) noted that the degree of sampling uncertainty has been greatly reduced by the addition of the VRI model approach to determining finite growth dynamics of sampled forest polygons. However, the SCSSN stated the opinion that the inventory is not accurate enough to set an AAC, and recommended that resources be provided to complete an accurate and up to date inventory for the TSA. It was also recommended in this input that a sensitivity analysis regarding the level of scientific uncertainty about the age classes on the inventory be completed. Similar input from the Sunshine Coast Forest Coalition requested sufficient funding be provided to ensure completion of forest inventory research.

I have considered the input received about the inventory data for the Sunshine Coast TSA. I note that the Phase II VRI data is considered to be the most current and statistically accurate information on the existing inventory on the land base, and as a result I do not accept the premise that another inventory must be completed in the TSA before an AAC can be determined, given the recent reinventory and Phase II VRI information were used in the analysis.

Sensitivity analysis was completed to assess the timber supply implications if existing stand volumes were not adjusted using the VRI ground sample data. The results indicate that a harvest level of 1 157 789 cubic metres per year can be maintained throughout the planning horizon, a level that is 6 percent below that of the maximum even flow harvest forecast, and one percent above the level of the current AAC.

The VRI sampling did not exclude roaded areas, and therefore the volume adjustment ratios derived inherently included an accounting for the site productivity losses for roads. Given that an area reduction was applied in the analysis to account for existing roads (as discussed under *roads, trails and landings*) the VRI volume adjustment ratios were altered in the analysis in order to avoid double counting in those stands with existing roads. I have reviewed the approach taken in this regard, and I am satisfied that there was not an overestimation in the site productivity lost to existing roads as a result of the methodology in the analysis.

The adjustments made to the age and height estimates on the inventory file using the VRI phase II data also resulted in a refinement of the site index estimates for existing stands. Staff state that, on average, the VRI data indicated lower ages and greater heights for the majority of existing stands, which led to higher site indices overall. The volume estimates for existing stands are considered more accurate as a result of using the VRI data. Adjustments to account for the increased growth of regenerating stands are discussed further in this document under *site productivity estimates*.

I have considered the information about existing stand volume estimates, and the use of the Phase II VRI data in the analysis. I am familiar with the rigour of the process used to collect the data for the VRI, and I have reviewed the statistical accuracy of the information obtained. Overall, I am satisfied that the VRI data provides an inventory estimate within acceptable limits of accuracy.

I am mindful that the set of adjustments based on the VRI data, on their own merits, result in a 6 percent increase in timber supply in the Sunshine Coast TSA. In fact, the difference between the reference forecast in which the current AAC was projected, and the maximum even flow harvest forecast is largely predicated on the adjustments to existing stand volumes using the VRI data. While I am satisfied that the VRI data provides an improved assessment of existing stand volumes relative to the original inventory file, I am also mindful that the methodology associated with this inventory is relatively new, and that some uncertainty is still inherent in the application of the data to pre-existing inventory data, in particular for timber supply review purposes. I expect that the range of uncertainty is bounded within a fairly limited and narrow range, but is still present and of significance for this determination. As a result, I remain mindful of the range of uncertainty associated with the use of the VRI data, and I will discuss this further under 'Reasons for decision'

Expected rate of growth

I have considered the information regarding the operational adjustment factors applied to volume estimates for regenerated stands as well as the assumed minimum harvestable ages in the analysis. I am satisfied that the analysis assumptions were appropriate for these factors, and I will not discuss my considerations in detail in this rationale.

- site productivity estimates

Inventory data includes estimates of site productivity for each forest stand. Site productivity is expressed in terms of a site index, which is based on the stand's height as a function of its age. The productivity of a site largely determines how quickly trees grow,

which in turn affects the time seedlings will take to reach green-up conditions, the volume of timber that can be produced, and the age at which a stand will reach a merchantable size.

In general, in British Columbia, site indices determined from younger stands (i.e. less than 31 years old), and older stands (i.e. over 150 years old) may not accurately reflect potential site productivity. In young stands, growth often depends as much on recent weather, stocking density and competition from other vegetation, as it does on site quality. In old stands, which have not been subject to management of stocking density, the trees used to measure site productivity may have grown under intense competition or may have been damaged, and therefore may not reflect the true growing potential of the site. This has been verified in several areas of the province where studies—such as the Old-Growth Site Index (OGSI) 'paired plot' project and the 'veteran' study—as well as results from using the Site Index Biogeoclimatic Ecosystem Classification System (SIBEC) suggest that actual site indices may be higher than those indicated by existing data from old-growth forests. Such studies indicate that site productivity has generally been underestimated by the inventory file data; managed stands tend to grow faster than projected by inventory-based site index estimates from old-growth stands.

No local site index studies have been conducted in the Sunshine Coast TSA. As mentioned under *volume estimates for existing stands*, the use of the VRI data resulted in more refined estimates of site index for the existing stands in the TSA but did not provide data from which to further adjust the future productivity of stands regenerating on the sites currently occupied by old growth stands. Stands greater than 140 years of age comprise about 18 percent of the timber harvesting land base in the TSA. Sensitivity analysis was used to examine the timber supply implications if the site index adjustments suggested by the provincial OGSI studies were appropriate for the stands in the Sunshine Coast TSA. In the sensitivity analysis, site indices of stands older than 140 years were adjusted using either the paired-plot or veteran-tree results, whichever was applicable. Paired-plot results were applied to coastal Douglas-fir stands older than 140 years within the Coastal Western Hemlock (CWH) biogeoclimatic zone. Veteran tree results were applied to hemlock stands older than 140 years, also within the CWH Zone. Managed stand volume estimates for those analysis units affected by changes in estimated future productivity were recalculated based on the average adjusted site productivity. Green-up ages and minimum harvestable ages were also recalculated.

The sensitivity analysis results indicate that if site productivity is underestimated to the extent suggested by the OGSI studies, the harvest level could increase to 1 318 000 cubic metres per year across the analysis horizon, a level 7 percent greater than shown in the maximum even-flow reference forecast.

It is interesting to note that an adjustment to the site productivity of stands occupying less than 18 percent of the timber harvesting land base should result in as great an increase in timber supply as shown by the sensitivity analysis. Staff advise me that these results are largely due to the fact that the initial harvest level in the maximum even flow reference forecast was constrained by the even flow harvest policy. The reference forecast did not entirely reflect the productive capacity of the growing stock on the timber harvesting land base, and in fact there was an excess of growing stock at the start of the analysis horizon. As discussed under Alternative rates of harvest, an initial harvest level 9 percent greater

than in the maximum even flow reference forecast could be supported by the available growing stock for five decades before declining.

I have considered the information about the site productivity of stands regenerating in the Sunshine Coast TSA. I acknowledge that some uncertainty exists with respect to the ultimate performance of stands relative to their potential. However, data from the paired-plot study clearly demonstrates that stands are growing at a much faster rate than would be expected based on measurements from the standing old growth inventory. Given existing silvicultural requirements, it is reasonable to expect that full stocking will occur in the majority of managed stands, and that the stands will be managed to minimize losses to pests and competing vegetation. Therefore, while the exact magnitude of the productivity increase is not certain, I believe it is highly reasonable to expect that most second-growth stands will grow more quickly than productivity estimates from old-growth stands would suggest.

I am aware that the refined data from the VRI resulted in site productivity estimates higher than originally available from the inventory file. However, it did not provide an assessment of the growth rates possible from regenerating stands in the TSA. Local data will provide much needed certainty around the magnitude of site productivity adjustments appropriate for the Sunshine Coast TSA. To this end, I strongly encourage the collection of data from stands within the TSA over the term of this determination.

In this determination, I am prepared to take into account the implications of an underestimation in volumes for regenerating stands as a result of underestimated site productivity. I am satisfied that timber supply in the mid to long term is greater than projected in the maximum even flow reference forecast, by an amount up to 7 percent, although the exact magnitude of this underestimation is as yet uncertain. I will discuss my considerations of this further under 'Reasons for decision'.

- use of select seed

The Forest Practices Code requires the use of the best genetic quality (seed and vegetative material) source available for regeneration. Select seed produced from seed orchards is the product of B.C.'s forest gene resource management program, which uses traditional tree breeding techniques to select naturally-occurring, well-adapted, healthy and vigorous trees.

Select seed from seed orchards produces trees that grow faster than those from natural stand seed. As a result, a stand composed of such trees has a greater volume at the same age than a natural stand with the same species composition. Current expectations are that the volume differences will begin to decrease beyond a certain stand age.

Information from the BCFS Tree Improvement Branch on the current use and quality of select seed was used to predict volume gains in the base case of the analysis. Using this information, volume increases of 3.6 percent for Douglas-fir, 1.9 percent for hemlock and 1.3 percent for western redcedar were applied to managed stands in the analysis. The timber supply implications of gains expected to be available in the future were not examined.

Public input from the Tuwanek Ratepayers Association expressed concern about the limited genetic variability of forests regenerated from select seed. I will respond to this input by noting that tree breeding conducted by the BCFS as well as seed orchard management

practices can actually increase genetic variability in forests regenerated with select seed. Parents, selected from a variety of stands and plantations for their desirable traits and broad adaptation, are brought together to mate in seed orchards. These parents would not otherwise have had the opportunity to cross-pollinate in the wild. Research has also shown that there can be high levels of relatedness within wild stands; therefore, seed orchard seed can contain more genetic diversity than seed collected from a local stand. The ministry's technical registration standards also ensure that each select seedlot used for Crown land reforestation contains a minimum level of genetic diversity. I am therefore confident that the genetic diversity and stability of our forests are not being compromised by using select seed.

The Sunshine Coast Forest Coalition expressed the opinion that the assumptions used in the base case underestimated the volume gains from the use of select seed. However, I am confident that the assumptions in the base case are consistent with a responsible application of the known data. As we continue to monitor growth implications of future levels of use and projected genetic gain, we can adjust our knowledge appropriately.

Having considered the information regarding the use of select seed in the Sunshine Coast TSA, I am satisfied that the analysis assumptions reflect the best available information, and I make no adjustments in this regard.

(ii) the expected time that it will take the forest to become re-established on the area following denudation,

Expected time for forest to be re-established following harvest

I have reviewed the information regarding regeneration delay and not-satisfactorily-restocked areas, and I am satisfied that the assumptions in the analysis for these factors were appropriate. As a result, I will not discuss my considerations in detail in this rationale.

- regeneration

In the analysis for the Sunshine Coast TSA, all hemlock-leading stands were assumed to regenerate back to hemlock-leading stands.

District staff indicate that this assumption does not account for the planting of Douglas-fir on many of the sites originally occupied by hemlock. Staff state that a significant proportion of the stands in the lower elevation biogeoclimatic variants will, in reality, regenerate to Douglas-fir leading stands with components of hemlock and western redcedar. It is estimated that the total area subject to the above species conversion following harvest comprises between 17 and 20 percent of the timber harvesting land base.

Given this new information, I asked BCFS staff to conduct subsequent analysis to evaluate the timber supply implications of adjusting the regeneration assumptions to better reflect current practice. The evaluation included an assessment of the volume implications as well as an accounting for the site productivity implications of the different species. Results from this assessment, although subject to some uncertainty, indicate that timber supply in the maximum even flow reference forecast has likely been overestimated by an amount in the range of between 1.6 and 1.9 percent on this account.

I have reviewed the methodology used to assess this information, and I am satisfied that it is sound and provides a reasonable assessment of the timber supply implications. Therefore, I believe that I must account for the implications of this species conversion in this determination. I will thus take into account that timber supply has been overestimated in the maximum even flow reference forecast by between 1.6 and 1.9 percent, and I will discuss this further under 'Reasons for decision'.

- impediments to prompt regeneration

Impediments to prompt regeneration not accounted for in the analysis could increase the uncertainty in the assumptions related to growth and yield that were used in the timber supply analysis.

District staff indicate that vegetation competition from species such as red alder and big leaf maple is a problem on some regenerating sites in the Sunshine Coast TSA. In particular, red alder invasion of free growing stands and on old roadways is of concern to district staff. However, they note that prompt reforestation and the establishment of high quality planting stock following harvesting improves reforestation success on at risk sites, and reduces the need for repeated brush treatments on susceptible sites.

Also of concern to district staff are mortality losses in young stands from root diseases such as *Armillaria ostoyae* and *Phellinus weirii*. Animal damage from deer, elk, voles and porcupine also occurs. However, staff are satisfied that additional losses from these sources were accounted for in the operational adjustment factors applied in the base case to regenerated stand yields. Staff indicate that management practices are structured to minimize, to the extent possible, the timber supply implications of these agents, such as the planting of resistant species in areas of known root disease, or the use of seedling protectors during planting.

Recently, however, in specific areas staff have noted more extensive damage to young stands from black bears, as well as hemlock looper. Staff indicate that they do not yet have data to quantify the growth impacts, but believe that it may be significant enough to impact volumes. Staff plan to collect data to enable assessment of the concern prior to the next timber supply review.

I have reviewed the information about impediments to regeneration for stands in the Sunshine Coast TSA. With regard to the concern about alder and maple invasion, I believe it likely that the ingrowth of these species will result more in species differentiation rather than having significant implications in terms of volume losses. I suspect that overall productivity is maintained on those sites despite the higher proportions of deciduous species. As a result, I request that district staff continue to monitor the concern but I will not make any adjustments for this determination.

With respect to the concern about black bear and looper damage to young stands, I will remain mindful that regenerated stand volumes may be reduced to a small degree on account of these biotic factors. As a result, I accept that mid- to long-term timber supply may be overestimated by some small, unquantified amount on this account. I will discuss my considerations of this further under 'Reasons for decision'.

(iii) silviculture treatments to be applied to the area,

Silvicultural treatments to be applied

- incremental silviculture

Incremental silviculture includes activities such as commercial thinning, juvenile spacing, pruning and fertilization that are beyond the silviculture activities required to establish a free-growing forest stand.

The timber supply analysis included assumptions that all higher productivity Douglas-fir, hemlock, balsam, western redcedar, lodgepole pine and red alder stands would be spaced to between 600 and 900 stems per hectare. There were no specific assumptions in the analysis to account for pruning or fertilization activity in stands.

District staff indicate that the analysis assumptions for juvenile spacing are reflective of past practices in the TSA. However, staff point to the fact that funding for incremental silviculture has been declining and they do not expect future funding to support the same level of spacing.

Staff also indicate that past fertilization of specific stands in the TSA has resulted in an additional 232 000 cubic metres of volume expected from these stands at time of harvest. This additional volume was not accounted for in the analysis. Staff do not expect a significant fertilization program in the future.

There were no specific assumptions made in the analysis to account for commercial thinning. Staff indicate that the program within the TSA has been small with a total of 135 hectares thinned since 1995. In consideration of the small amount of area involved, I am satisfied that there are no implications to timber supply as a result of not explicitly accounting for commercial thinning.

I have reviewed the information regarding incremental silviculture. I note that what was modelled in the analysis attempted to approximate the historical juvenile spacing program in the TSA, and it is difficult to predict future levels of treatment. I accept that the historical levels of spacing may not occur as projected, but I note that any disparity will not have consequential impacts in terms of volume. If the program does change significantly in the future, then the implications to timber supply can be accounted for in a future determination. I am not going to make adjustments in this determination on account of this factor.

With respect to my consideration of the fertilization assumptions in the analysis, I am satisfied that it is appropriate to take into account a one time inventory volume adjustment as a result of past fertilization. This adjustment is 232 000 cubic metres of volume and relates to a total of 69 million cubic metres of volume on the timber harvesting land base, which makes the adjustment in the range of 0.3 percent of the total inventory volume. In consideration of the magnitude of this adjustment across the analysis timeframe, I note that it amounts to a negligible increase in timber supply. I am satisfied that this is insignificant for this determination, and I therefore will make no adjustment on this account.

- silvicultural systems

The majority of the harvesting in the Sunshine Coast TSA is done through the use of even-aged silvicultural systems.

The Small Business Forest Enterprise Program (SBFEP) employs alternative silvicultural systems in areas adjacent to communities along the Strait of Georgia.

In the timber supply analysis, the majority of the timber harvesting land base was assumed to be harvested using clear cut silvicultural systems. A 'community interface' management zone was delineated for stands (predominantly Douglas-fir) growing on productive sites along the Strait of Georgia, to reflect the management practiced in these areas, including the use of partial cutting silvicultural systems. In total, 11 286 hectares or five percent of the timber harvesting land base was assumed to be harvesting using partial cutting systems requiring two harvest entries.

District staff indicate that the analysis assumptions for the community interface zone were reflective of current practice. However, staff indicate that for the area outside this zone, a greater proportion of stands are harvested using alternative silvicultural systems than was reflected in the analysis. A recent review of forest development plan (FDP) data indicates that approximately 40 percent of harvesting is projected to be done through the use of alternative systems.

This information indicates a disparity between the use of partial harvesting assumed in the analysis (5 percent) and the use in current practice (40 percent). However, district staff note that it is difficult to assess the true disparity between actual practices and what was modelled in the analysis because 'clearcut with reserve' silvicultural systems—which comprise the majority of alternative systems in use operationally—are described as partial harvesting systems on operational plans. In the analysis, these systems were accounted for as clearcutting systems, and the assumptions for wildlife tree retention (discussed later in this rationale under *stand level biodiversity)* included a percentage reduction applied to the timber harvesting land base outside the community interface zone to account for the reserved area. Therefore, the stand level biodiversity assumptions provide accounting for the use of clearcut systems with reserves.

However, staff indicate that even given this consideration, they believe that partial harvesting is in greater use than assumed in the analysis and its application is increasing in the TSA.

Recent studies have shown that there are productivity losses associated with the use of alternative silvicultural systems. A study was recently conducted in the area of Robert's Creek to assess site productivity losses resulting from the use of alternative systems. The research results indicate that early height and stem caliper growth of the planted regeneration in non-clearcut areas was less than that in clearcut areas. However, the longer-term growth implications for regeneration in alternative silvicultural systems is expected to depend on the conifer species, ecosystem, and the expected long-term retention of the associated overstory trees. If the overstory trees are permanently reserved from harvest, yield reductions will be appropriate. Staff also indicate that there was a shift of regenerating tree species to those species such as hemlock that are well adapted to regenerating naturally and in shadier conditions.

I am also aware that Weyerhaeuser's recently completed timber supply analysis for TFL 39, (Block one of which lies adjacent to the Sunshine Coast TSA), included a managed stand volume reduction of 3 percent to account for the volume losses expected to result from the use of variable retention.

I have considered the information about silvicultural systems, and the assumptions in the timber supply analysis. I note that across the province there is an increasing trend to the use of alternative silvicultural systems and I have no reason to believe that this trend will not also be apparent in the Sunshine Coast TSA. As a result, I am convinced that what was reflected in the analysis does not represent either current or expected future practices for silvicultural systems in the TSA. Given the productivity implications associated with the use of alternative silvicultural systems, I accept that timber supply has likely been overestimated in the analysis. I will discuss this further under 'Reasons for decision'.

(iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area,

Timber harvesting

I have reviewed the information regarding the decay, waste and breakage factors assumed in the analysis for the Sunshine Coast TSA, and I am satisfied that these factors were appropriately modelled in the analysis.

- utilization standards

Utilization standards define the species, dimensions and quality of trees that must be harvested and removed from an area during harvesting operations. The standards used in the timber supply analysis were consistent with values applied regionally and in other coastal units.

District staff indicate that the standards assumed in the analysis differ from current practice in several ways as outlined in the table below:

	Analysis			Operational Requirements		
	stump height	dbh	top dib	stump ht	dbh	top dib
Natural Coniferous <=120 years old	30	17.5	10	30	12.0	10
Natural stand >120 years old	30	17.5	10	30	17.5	15
Deciduous <=40 years old	30	17.5	10	30	12.0	10
Deciduous >40 years old	30	17.5	10	30	17.5	15
Managed coniferous	30	12.5	10	30	12.0	10

With respect to the discrepancies with the minimum top diameter inside bark (dib) standards, I note that review of this factor for other administrative units has shown that differences of the magnitude described have a negligible impact in terms of timber supply. However, I asked staff to provide further clarification on the significance of the

discrepancies in minimum diameter at breast height (dbh) values. Staff advise that a review of the VRI data indicates the net volumes for merchantable coniferous stands under 120 years of age that are compiled using a 12.5 centimetre dbh are 2.5 percent higher than those volumes compiled using a 17.5 centimetre dbh.

In the maximum even-flow forecast, natural coniferous stands under 120 years old contribute approximately 15 percent of the harvested volume over the analysis horizon. Most of this volume is harvested between the third and eighth decades. Based on this contribution, staff estimate that timber supply has been underestimated in the mid term by about 0.4 percent on this account.

Public input from the Tuwanek Ratepayers Association stated that the utilization levels conflict with the *Biodiversity Guidebook*'s standards for coarse woody debris, one of the components of ensuring stand level biodiversity. I am aware of this concern, and I agree that more research needs to be conducted to assess whether our current policies around stand level biodiversity, which do not include a focus on coarse woody debris retention at the current time, is compromising the ability to meet stated objectives for stand level biodiversity. I also note that the assumptions in the analysis were applied consistently with provincial policy and are reflective of practices that guide current management operationally. Research is ongoing around the issues raised in the stated concerns. As research results become available, the extent to which they result in a change in operational practices can be reflected in future AAC determinations. In any event, I note that timber supply is not highly sensitive to uncertainty or changes in utilization standards.

Having considered the information about the utilization standards in the Sunshine Coast TSA, I will take into account a slight underestimation of timber supply of about 0.4 percent, and I will discuss this further under 'Reasons for decision'.

(v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production,

Integrated resource management objectives

The Ministry of Forests is required under the *Ministry of Forests Act* to manage, protect and conserve the forest and range resources of the Crown and to plan the use of these resources so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are coordinated and integrated. Accordingly, the extent to which integrated resource management (IRM) objectives for various forest resources and values affect timber supply must be considered in AAC determinations.

To manage for resources such as water quality and aesthetics, current harvesting practices limit the size and shape of cutblocks and amount of disturbance (areas covered by stands of less than a specified height), and prescribe minimum green-up heights for regenerated stands on harvested areas before adjacent areas may be harvested. Green-up requirements provide for a distribution of harvested areas and retention of forest cover in a variety of age classes across the landscape.

In the timber supply analysis, as described in the *June 2001 Sunshine Coast Timber Supply Area Analysis Report*, several management zones—for community watersheds, ungulate

winter range, visuals, community interface and general management—were created and different forest cover constraints were applied to the stands in each zone.

I have reviewed the information presented to me regarding the analysis assumptions for cutblock adjacency/green-up, riparian management, cultural heritage resources and recreation, and I am satisfied that the analysis has appropriately reflected the values and operational constraints for these factors. As a result, I will not discuss my considerations of these factors in detail in this rationale.

- riparian habitat

Riparian habitats occur along streams and around lakes and wetlands. The Forest Practices Code requires the establishment of riparian reserve zones (RRZs) that exclude timber harvesting, and riparian management zones (RMZs) that restrict timber harvesting, in order to protect riparian and aquatic habitats. Stream classes (e.g. S1) described in the *Riparian Management Area Guidebook* are determined based on presence of fish, occurrence in a community watershed and average channel width criteria. The stream class is used to estimate RRZs and RMZs requirements.

To prepare the data for the analysis, district staff conducted a review of silvicultural prescriptions (SPs) to assess the area retained in reserves and management zones. Based on the review, the timber harvesting land base was reduced by 9568 hectares or 3.3 percent to account for management practices in riparian areas.

I have reviewed the assumptions used in the analysis to account for riparian habitat requirements. I note that because the information was derived from a review of SPs, it is likely most reflective of past and current management, and may not entirely reflect management practices into the future. In particular, retention rates in RMZs may change over time. However, I believe the methodology used was acceptable, and the percentage reductions reasonably reflect management practiced operationally to protect riparian habitat. As a result, I make no adjustments on this account.

I request that district staff work to complete a stream inventory in the TSA so that any residual uncertainty around the appropriate reductions can be resolved prior to the next determination for the Sunshine Coast TSA.

- visually sensitive areas

Careful management of scenic areas along travel corridors and near recreational sites is an important IRM objective. The Forest Practices Code enables the management of visual resources by providing for scenic areas to be identified and made known by the district manager or through a higher level plan, and by providing for the establishment of visual quality objectives (VQOs). A visual landscape inventory identifies, classifies and records visually sensitive areas within a landscape. Using such an inventory, recommended visual quality classes (RVQCs) of preservation, retention, partial retention or modification may be derived to guide operational practices. These recommended VQCs may become VQOs established by the district manager or through a higher level plan.

Approximately 50 percent of the timber harvesting land base in the Sunshine Coast TSA is considered to be visually sensitive. Visual landscape inventories were collected for the Sunshine Coast TSA in the early 1990's, and were revised over time to reflect an

appropriate balance between visual quality and forest harvesting activities. Management for visual quality applies to the Crown forested land within scenic areas. In the Sunshine Coast TSA, scenic areas were officially made known and visual quality objectives were established by the district manager in May 1997. Revisions were subsequently made to the scenic areas as part of the 1998 *Strategy for Managing Visual Resources to Mitigate Impacts on the Timber Supply* in the Vancouver Forest Region. The mitigation strategy was initiated subsequent to the implementation of the Forest Practices Code, in order to account for the improved management practices resulting from the Code.

Under the mitigation strategy, the extent of the area formally classified as scenic in the TSA was reduced. The area classified as visually sensitive was also reviewed, and as a result, the area now considered to be visually sensitive encompasses 111 000 hectares of timber harvesting land base, rather than the 124 000 hectares of timber harvesting land base managed for visual quality in 1995. Also as part of the mitigation strategy, the visual quality objectives for areas were reviewed and some adjustments were made to recommended visual quality classes.

To achieve objectives for visual quality, limits are placed on the amount of visible disturbance that is acceptable in visually sensitive areas. Guidelines to meet VQOs include setting a maximum percentage of a visual landscape allowed to be in a disturbed state at any one time, and setting visually effective green-up (VEG) targets that must be achieved before additional harvesting is permitted. VEG refers to the stage at which a reforested area is perceived by the public to be satisfactorily greened-up from a visual standpoint. Visually effective green-up for the Sunshine Coast TSA was assumed to be 5 metres, which equates to an average age of 16 or 17 years.

Visually sensitive areas comprise 50 percent of the timber harvesting land base assumed in the analysis. Three percent of the timber harvesting land base is classified as retention, 39 percent as partial retention and 8 percent as modification. Using the assigned VQOs, areas were grouped into specific zones and the constraints were applied to each zone as the maximum percentage of productive forest area within each landscape unit that could be occupied by stands less than a certain height.

The restrictions for percent permissable disturbance and green-up requirements were applied to the entire productive forest land base because disturbance restrictions in visual areas apply to the entire viewscape regardless of operability. Values for the maximum percentage of disturbance that would reflect those applied in current practice were determined using provincial guidelines for factoring visual resources into timber supply analyses. For the Sunshine Coast TSA, district staff recommended modelling permissible disturbance at the maximum of the indicated ranges, as visual landscape design techniques are practised in the TSA.

The percentage of the productive forest area that could be less than a specified height at any one time was as follows:

- for the retention VQO zone, no more than 5 percent of the area could be less than 5 metres in height;
- for the partial retention VQO zone, no more than 15 percent of the area could be less than 5 metres in height; and

- for the modification VQO zone, no more than 25 percent of the area could be less than 5 metres in height.

A sensitivity analysis was conducted to test the impact of lowering the percentage of permissable disturbance to the mid point rather than the maximum end of the range, as was modelled in the 1995 timber supply analysis. The results showed that the harvest level was reduced by 5 percent on this account beginning in the eighth decade, as compared to the level of the maximum even flow harvest forecast.

One of the most significant differences in the modelling of visual quality objectives between this analysis and the one for the previous timber supply review relates to the modelling technique. During the first timber supply review, maximum levels of disturbance were applied to the timber harvesting land base only. At that time, to account for the mitigating effect of the surrounding non-contributing forest on visual impact, a 'green to operable' ratio was calculated, and the maximum allowable percent disturbance within a visual quality class was then increased based on this ratio. In the 2001 analysis, the productive forest outside of the timber harvesting land base was allowed to contribute to the visual landscape. BCFS staff advise me that the difference in technique, which is a technical improvement over that used in the past, is a significant factor in the different timber supply projected under visual constraints between 1995 and 2001.

The Sunshine Coast Forest Coalition asked the BCFS to revisit visual quality objectives, commenting that new harvesting techniques result in more available volume without impact on visuals. BCFS staff agree that the use of alternative silvicultural systems allows for greater flexibility in harvest without diminishing the quality of visual resources. However, staff note that the 1998 mitigation strategy included a consideration of the implications of these harvesting techniques on visual quality management. In addition, in the analysis, the use of the maximum end of the allowable disturbance range assumes the implementation of good visual design techniques, including the use of partial harvesting systems.

The Sunshine Coast Species Survival Network expressed the opinion that the area classified as visually sensitive and visual quality objectives used in the previous timber supply review should be restored given the expanding tourism industry and the needs for wildlife habitat. Other public input expressed the opinion that downgrading of visual quality objectives was accomplished in 1998 in spite of broad local opposition from other economic sectors. The Sunshine Coast Conservation Association also stated that VQOs have been systematically devalued and have ceased to have any appreciable effect on maintaining scenic landscapes.

BCFS staff respond by noting that public input was an important consideration in the implementation of the mitigation strategy and that the areas in which visual quality objectives were made less constraining on timber supply (e.g., from retention to partial retention, and from partial retention to modification) did not include areas considered to be of high importance to the tourism sector nor subject to heavy recreational use. I have reviewed the map showing the current designated scenic areas in the TSA, and I am satisfied that the changes made to these areas during the implementation of the mitigation strategy have not degraded the value of the scenic resource. In fact, I believe that the visual quality objectives prior to the implementation of the 1998 mitigation strategy likely constrained harvesting operations on the land base to a degree that was in excess of what

was required to ensure integrity of the scenic resource. It is significant to note that 50 percent of the timber harvesting land base within the Sunshine Coast TSA still falls within visually sensitive areas, and I believe this indicates a high level of accounting for the visual resource in the analysis. Operationally, provisions for limitations on block size, levels of disturbance and retention of leave areas ensure maintenance of the integrity of the visual landscape in areas of high scenic values.

Also in response to the public input, I further note that separate provisions are made both in the analysis and operationally to account for wildlife habitat, and therefore wildlife habitat needs are not expected to be solely accommodated through the management for visual quality. However, with this said, visual quality management can certainly have benefits for wildlife.

I have considered the analysis assumptions regarding the management of visual resources in the TSA. I am satisfied from my review of the information that the analysis assumptions are a reasonable approximation of current management in the TSA for visual quality.

- *community watersheds*

The Forest Practices Code provides a definition and management considerations for community watersheds. A total of 23 860 hectares, or approximately 11 percent of the timber harvesting land base of the Sunshine Coast TSA is contained in 26 community watersheds.

A community watershed is defined under the Forest Practices Code as the drainage area that provides water for human consumption and that is licensed under the *Water Act* for a waterworks purpose or a domestic purpose, assuming the drainage area is not more than 500 square kilometres and the water licence was issued before June 15, 1995. This definition accounts for the majority of community watersheds in existence when the Forest Practices Code came into effect. Community watersheds not covered under this definition can be designated as such by the appropriate regional manager and a designated environmental official.

Operationally, watershed assessment procedures (WAPs) are conducted by hydrologists in community watershed areas to determine whether planned operations can be conducted without detriment to water quality resources. A WAP considers the cumulative effects of forest practices on the watershed hydrology. The assessment of hydrological impacts includes an assessment of the potential for the following processes to occur as a result of planned operational practices: changes to peak streamflows; accelerated landslide activity; accelerated surface erosion; channel bank erosion; and, changes to channel morphology. An evaluation of the interaction of these processes provides an indication of the sensitivity of the watershed to further forest development. Using the results of a WAP, forest managers can make recommendations concerning the level of further harvesting, if any, in the watershed.

A key component of watershed management includes calculation of equivalent clearcut area (ECA), which is the area that has been harvested, cleared or burned, with consideration given to the silvicultural system, regeneration growth and location within the watershed.

In the timber supply analysis, the community watersheds in the TSA were grouped into a community watershed zone, and a forest cover constraint was applied which limited the

amount of harvesting within each watershed to one percent of the productive forest area each year. This constraint was developed based on guidance in the *Community Watershed Guidebook* that indicates that in the absence of a completed Coastal Watershed Assessment Procedure, harvesting activity should be limited to 5 percent of the productive forest area over a 5 year period. The recommended constraint was correlated to a one percent per year limit in the analysis.

District staff indicate that operationally, harvesting is guided by watershed assessments prepared in accordance with the Coastal Watershed Assessment Procedures. Harvesting is currently occurring in 14 of the TSA's community watersheds.

In its public input, the Sunshine Coast Regional District made note that it is opposed to logging in community watersheds, and in particular the Chapman Gray Creek Community Watershed. District staff respond that a BCFS moratorium on harvesting in the Chapman Gray Creek watershed was lifted recently when an integrated watershed management plan completed by BCFS staff and stakeholders was completed. I am aware that the plan was not endorsed by the SCRD. Harvesting practices in this watershed are governed by the measures of the Forest Practices Code. Related public input received from the Sunshine Coast Species Survival Network expressed the opinion that the cost of water filtration and increasing the distribution system is greater than any economic or social benefit to be gained from logging. In response to this latter point, I note that while assessment of economic and social benefits tends to be complex, in the absence of detailed supporting evidence, I consider it probably that the economic benefit of responsible harvesting to both the local communities and the province is greater than expressed in this opinion.

I have considered the information about community watersheds, and discussed the information with district staff. I am satisfied that the level of constraint assumed in the base case reasonably reflects the constraints applied operationally in these areas, and as a result, I make no adjustment on this account.

- wildlife habitat

The forests of the Sunshine Coast TSA provide habitat for a broad diversity of wildlife species, including grizzly and black bear, mountain goat, black-tailed deer, cougar, wolf, marbled murrelet, northern goshawk, bald eagle, Keen's long-eared myotis and tailed frog.

In the timber supply analysis, areas delineated as Ew (sensitive for wildlife habitat) were excluded in the derivation of the timber harvesting land base, for a total of 929 hectares.

Following are my considerations of some of the provisions made in the analysis for wildlife species.

1) identified wildlife

'Identified wildlife' refers to species at risk (red- and blue-listed) and to regionally significant species which are potentially affected by forest management activities and which may not have been adequately accounted for with existing management strategies, such as those for biodiversity, riparian management, ungulate winter range or through the application of other forest cover constraints. Species at risk as defined under the Forest Practices Code also include those species that are not considered at risk provincially but which have regional populations that may be threatened. The intent is that by

addressing the habitat needs of 'regionally important wildlife' early on, the possibility that they will become listed provincially as threatened or endangered at a later date may be avoided.

Volume I of the IWMS was released in February 1999 and details several species which may occur and which require future consideration in the TSA, including the following: bull trout, tailed frog, American bittern, northern goshawk, marbled murrelet, Keen's long-eared myotis, fisher, grizzly bear and mountain goat. Volume II, which has yet to be released, may identify additional species. The species identified in Volume I will be managed through the establishment of wildlife habitat areas (WHAs) and implementation of general wildlife measures (GWMs), or through other management practices specified in higher level plans.

Thirteen WHAs for grizzly bear have been established thus far in the Sunshine Coast TSA, encompassing 350 hectares of timber harvesting land base. District staff and staff from the Ministry of Water, Land and Air Protection (MWLAP) indicate that additional grizzly bear WHAs are expected to be established in the future. Staff note that older sitka spruce-leading stands, as well as those stands with a significant spruce component, provide high capability grizzly bear habitat. All stands with less than 300 cubic metres of volume per hectare, including sitka spruce-leading stands, were excluded from the timber harvesting land base in the analysis as discussed under *unmerchantable forest types*. BCFS staff estimate that between 200 and 300 hectares of sitka spruce-leading stands remain in the timber harvesting land base after accounting for these exclusions. These areas also overlap to a certain extent with riparian habitat, for which exclusions were applied in the analysis as discussed under that section of this rationale.

In addition, four WHAs for marbled murrelet have been established, totalling 1206 hectares, of which only 18 hectares lie within the timber harvesting land base. Staff indicate that an additional 5 WHAs totalling 1497 hectares are pending, but only 8 hectares of this area falls within the timber harvesting land base. Given the occurrence of the species in the TSA, and the high value habitat present, staff expect that numerous additional WHAs will be delineated for marbled murrelet over time.

The established WHAs for grizzly bear and marbled murrelet comprise a total of 368 hectares of timber harvesting land base. This area was not explicitly excluded in the derivation of the timber harvesting land base in the analysis.

As mentioned under *economic and physical operability*, district staff note that conflicts have occurred when harvesting operations are proposed in areas where draft WHAs are delineated in the inoperable land base. I note that where the values are known to be present, whether inside or outside the defined operable land base, then measures of protection should be undertaken, such as through the establishment of WHAs or old growth management areas (OGMAs).

Public input from the Roberts Creek Community Association noted that the IWMS has not been implemented as promised, and that the minimum standards outlined in the Forest Practices Code are being treated as maximums operationally.

In response to this input, I note that under the Code, it is intended that management for wildlife habitat meets the needs of the species considered. In addition, the one percent target described by government for the IWMS was derived based on a detailed impact

analysis conducted by biologists, and was not a maximum amount of habitat that could be reserved, but rather was seen as the expected impact on timber supply resulting from meeting the needs of the wildlife species identified in volume one of the IWMS.

Input from an individual cited that a 1994 Marbled Murrelet Recovery Team report indicated a minimum of 10 percent of original old growth must be retained in order to provide for the habitat needs of the species. This input also stated that recent work shows the species is in decline because of the destruction of its breeding habitat. I am mindful of the concerns around marbled murrelet, and I note that a conservation assessment is currently underway which should provide us with clarity on the murrelet and the state of its habitat.

While candidate marbled murrelet WHAs can be identified (for potential designation) independent of the landscape unit planning process, district staff note that landscape unit planning and its establishment of OGMAs facilitate the identification of marbled murrelet nesting habitats and candidate WHAs. As landscape unit planning and the conservation assessment proceed, a better understanding of marbled murrelet habitat requirements will be gained, as well as identification of WHAs for needed marbled murrelet nesting habitat. It is expected that most of the needed marbled murrelet habitat can be found within the non-contributing (to timber harvesting land base), constrained (from harvesting) and partially constrained land base.

In consideration of the information, I am satisfied it is appropriate to take into account the exclusion of the area associated with established WHAs, which in total comprise 368 hectares of timber harvesting land base. Beyond the known impact of these areas already established, it is not possible at this time to specify the exact location or precise amount of additional habitat area that will be required within the timber harvesting land base as implementation of the IWMS continues. However, given the known presence of both grizzly bear and marbled murrelet in the TSA, as well as the expected presence of other identified wildlife species, it is clear that there will be further delineation of WHAs.

The Province has committed to implementation of the IWMS and limitation of short-term timber supply impacts to one percent across the province. I note that with taking into account the area of 368 hectares in currently established WHAs, the additional area associated with pending WHAs expected to be established in the very near term, and the 300 additional hectares of sitka spruce-leading stands expected to provide excellent grizzly bear habitat, the cumulative area comprises only 0.2 percent of the timber harvesting land base. I believe that within the stated provincial budget of one percent exists ample room to accommodate the establishment of many more WHAs in the TSA.

Given the species known to be present in this TSA, I expect that the ongoing establishment of WHAs will indeed reduce the timber harvesting land base by the full one percent described by provincial policy. I will thus take into account in this determination a one percent impact on timber supply, which I believe accommodates both currently established WHAs and those expected to be established in the near future for most species. However, I also believe it is possible that meeting the requirements for marbled murrelet habitat into the long term may require additional timber harvesting land base withdrawals than can be accommodated through the one percent target currently defined under the IWMS. I have

considered the risk posed to mid to long-term timber supply on this account and I will discuss this further under 'Reasons for decision'.

I commend staff for their work in the establishment of WHAs to date, and I encourage them to continue to establish WHAs and implement GWMs prior to the next determination for the Sunshine Coast TSA. The establishment of these areas is a significant protective measure of the Forest Practices Code, and will assist with long-term planning and reduce operational conflicts between wildlife and harvesting. In particular, as discussed under *economic and physical operability*, it is critical to establish those WHAs as appropriate in the non-contributing land base in order to reduce the conflicts between blocks proposed in areas previously thought to be inoperable, and measures for protection of identified species.

2) ungulate habitat

Ungulate winter range (UWR) for goats in the Sunshine Coast TSA has been identified and mapped through the use of aerial surveys over the past five years. Management plans for the ungulate winter range are currently under development and legal designation of the areas under the Operational Planning Regulation provisions is expected to occur prior to the October 2003 deadline.

A total of 86 000 hectares has been identified as ungulate winter range in the mapping process, primarily to address goat habitat needs. This mapping was used in the analysis. Of the mapped area, 465 hectares are entirely located within the timber harvesting land base and a further 5910 hectares partially contribute to the timber harvesting land base. An equivalent area reduction was made in the analysis of 2849 hectares to account for ungulate winter range.

Staff from MWLAP note that the majority of the UWR mapped to date is goat habitat, although there is some accounting for deer within the mapped range. Staff expect that in the future additional range will be mapped for other species.

I have considered the information about the provisions made in the analysis for ungulate habitat and I accept that the area excluded in the derivation of the timber harvesting land base provides a reasonable accounting for current ungulate winter range. I accept, however, that accounting for additional ungulate species may result in additional range which will likely have a small, unquantified impact on timber supply. For this determination, I will take into account the risk that timber supply has been slightly overestimated on this account, and I will discuss this further under 'Reasons for decision'.

- stand level biodiversity

Biodiversity is defined as the full range of living organisms, in all their forms and levels of organization, and includes the diversity of genes, species and ecosystems and the evolutionary and functional processes that link them. Under the Forest Practices Code, biodiversity in a given management unit is assessed and managed at both the stand and landscape levels.

Stand-level biodiversity management includes retaining wildlife tree patches (WTPs), within or adjacent to cutblocks to provide structural diversity and wildlife habitat. Where landscape unit planning has been completed and objectives have been set, table A3.1 in the *Landscape Unit Planning Guide* recommends retention rates for WTPs. Table A3.1 of the

guide was used in the timber supply analysis because the methodology for modelling of landscape level biodiversity requirements is intended to reflect the final implementation of landscape unit planning.

For the analysis, district staff followed procedures in the guide to determine the wildlife tree patch requirement for the analysis. Staff assumed that 75 percent of wildlife tree patch requirements would be met from otherwise constrained areas such as riparian reserve zones, gullies and areas with sensitive soils. To account for WTP requirements on the timber harvesting land base, a total of 4878 hectares were excluded in the analysis.

District staff conducted a review of data from nearly 100 SPs prepared around 1998. The SP data indicated that operationally, only 50 percent of wildlife tree patches are being placed in areas constrained from harvesting on the account of other values. Given that it was assumed in the analysis that 75 percent of requirements would be met from non-contributing areas, the impact of wildlife tree retention on timber supply was likely underestimated in the analysis by 50 percent. Staff estimate that a further 4878 hectares, or 2.2 percent of the timber harvesting land base should be excluded on this account.

I have considered the information about the provisions made in the base case to reflect management for stand level biodiversity. Although I believe that the review of the SP data provides a good starting point from which to identify discrepancies between the analysis assumptions and current practice, I am not convinced that the data from the review necessarily indicates that the impact of management for stand level biodiversity has been underestimated by a full 2.2 percent. I note that the review covered SPs prepared during a period of time directly following the full implementation of the Forest Practices Code. It is recognized that this period immediately following Code implementation resulted in patterns of management that were more restrictive than required by the legislation and provincial policy, and were greater than believed to be required to manage for specific resource values. These trends in management, which have not continued over time, included a greater retention of area in wildlife tree patches than is considered necessary to meet stand level biodiversity requirements.

In consideration of the above, for this determination, I will take into account that more area is being retained operationally than was assumed in the analysis, but I believe that this area amounts to somewhat less than a further 2.2 percent reduction to timber supply. I will discuss this further under 'Reasons for decision'.

Public input from the Sunshine Coast Conservation Association expressed the opinion that wildlife tree patch reductions do not constitute suitable surrogates for wildlife habitat areas. The Roberts Creek Community Association also commented that small WTPs would not provide suitable wildlife habitat for certain critical wildlife species. I agree with these statements, and I note that WTPs are not intended to replace the need for the establishment of WHAs and OGMAs on the land base in order to provide for wildlife habitat and landscape level biodiversity needs. Rather, the provisions for stand level biodiversity are intended to provide for some additional structural diversity on the landscape in conjunction with the other provisions under the Code.

I encourage district staff to continue to refine management objectives for stand level biodiversity, and monitor the level of WTP retention actually practiced, so that the implications to timber supply can be assessed again during the next timber supply review.

- landscape-level biodiversity

Achieving landscape-level biodiversity objectives involves maintaining forests with a variety of patch sizes, seral stages, and forest stand attributes and structures, across a variety of ecosystems and landscapes. Managing for biodiversity is based in part on the principle that this—together with other provisions in the Forest Practices Code, such as riparian management, maintenance of wildlife trees, and other forest cover objectives as discussed throughout this document—will provide for the habitat needs of most forest and range organisms. A major consideration in managing for biodiversity at the landscape level is leaving sufficient and reasonably located patches of old-growth forests for species dependent on, or strongly associated with, old-growth forests.

The delineation and formal designation of 'landscape units' is a key component of a sub-regional biodiversity management strategy. For the Sunshine Coast TSA, the boundaries of twenty four landscape units have been delineated. Two landscape unit plans—for the Bunster and Homathko Landscape Units—have been approved as higher level plans, and the BEOs for these landscape units have been established. Four additional landscape unit plans are expected to be approved prior to March, 2002.

The *Landscape Unit Planning Guide* outlines three biodiversity emphasis options (BEOs)—lower, intermediate and higher—which guide the establishment of biodiversity management objectives for a landscape unit. The guide outlines the proportions of each subregional planning area that should be assigned to each of the three BEOs. The proportions in lower and intermediate biodiversity emphasis can range from 30 to 55 percent, but the average is approximately 45 percent of the area in lower, 45 percent in intermediate, and 10 percent in the higher BEO landscape units. The policy generally followed for timber supply analyses when landscape units and BEOs have not been formally established is to model the distribution of BEOs using a weighted average forest cover requirement. Because not all landscape units have been established in the Sunshine Coast TSA, this policy was followed in the timber supply analysis.

The forest cover requirements were applied at the biogeoclimatic variant level within each landscape unit as a minimum percentage of the productive forest land base which must be retained in stands meeting the requirements for mature and old forest. The *Landscape Unit Planning Guide* permits old forest requirements for areas with low BEOs to be met within three rotations, and describes no mature forest retention requirements for these areas.

In high and intermediate BEO areas, current provincial policy direction from the *Landscape Unit Planning Guide* requires old seral requirements to be met immediately. If it is not possible to immediately achieve targets in these areas, then Old Growth Management Areas (OGMAs) are designated in mature forested areas to recruit old growth forest.

In the analysis for the Sunshine Coast TSA, the forest cover constraints for old-seral forest, including the phase in of the requirements for lower BEOs, were applied in accordance with the *Landscape Unit Planning Guide*. Forest cover requirements for old seral forest were applied at the biogeoclimatic variant level within each landscape unit as a minimum percentage of the productive forest to be retained in stands at least 250 years of age.

The non-contributing land base was assumed in the analysis to be subject to a rate of disturbance that approximated a natural disturbance regime for the area.

Four sensitivity analyses were conducted to assess the timber supply implications of uncertainty around the modelling of landscape level biodiversity requirements. In the first sensitivity analysis, the draft BEO assignments available for each landscape unit were applied, instead of the weighted average forest cover requirement approach used in the maximum even flow harvest forecast. In the second sensitivity analysis, the full old seral requirements were applied immediately in the low BEO areas. In the third analysis, mature and full old seral requirements were applied immediately using the draft BEOs available for each landscape unit. And in the fourth sensitivity analysis, the early, mature and full old seral requirements were applied immediately based on the draft BEOs for each landscape unit. In each case in these sensitivity analyses, timber supply was not affected at any point in the analysis horizon.

A significant amount of public input was received regarding the assumptions made in the analysis to account for landscape level biodiversity requirements. Some of this input questioned the use of the weighted averages rather than the mix of draft and established BEOs available for the TSA. Other input expressed the opinion that the full old seral requirements should be met immediately in low BEO areas. In general, the majority of the input questioned the ability of the analysis assumptions to meet the requirements of landscape level biodiversity.

In response to this input, I note that the analysis assumptions were made in a manner consistent with provincial policy, and expected to approximate the requirements for landscape level biodiversity. The assumptions regarding a phased-in approach to meeting old seral requirements are also consistent with provincial policy. However, I note that the results of the sensitivity analysis showed timber supply to be insensitive to full application of the old seral requirements in low BEO areas. I also note that the analysis assumptions included an accounting for the levels of natural disturbance in the inoperable land base, so that the contribution of this area to meeting old growth requirements was not overestimated in the analysis.

In consideration of the analysis assumptions regarding landscape level biodiversity, I am satisfied that the analysis was consistent with provincial policy, and that the best available information was used. I encourage staff to continue their work with landscape unit planning so that any additional information can be incorporated into the next analysis for the Sunshine Coast TSA.

(vi) any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber,

Deferrals and Delays

The Chapman/Gray Creek Community Watershed area, encompassing 7990 hectares of timber harvesting land base in the Sunshine Coast TSA, was subject to a moratorium on harvesting while preparation of an Integrated Watershed Management Plan (IWMP) was underway to resolve resource management conflicts in the area. The IWMP was completed but not agreed to by all stakeholders, and as a result relevant portions of the IWMP were not designated as a higher level plan. The deferral of development is no longer in place for the area . The Sunshine Coast Regional District is seeking management jurisdiction over the watershed. In the timber supply analysis, this area was included as part of the community watershed zone, and subjected to a forest cover constraint, as discussed under *community watersheds*.

Staff note that a 1500 hectare area on Mount Elphinstone has also been the subject of conflicts over land and resource use. The area was not designated as a Protected Area under the Lower Mainland Protected Areas Strategy. However, some local stakeholders are still actively pursuing protection of the area from resource development. In the timber supply analysis, the area was not excluded from the timber harvesting land base, but was included as part of the community interface zone to recognize the special management provisions employed.

I have reviewed the information about the areas in the TSA that are the subject of discussions over appropriate land use and management regimes. As discussed under my guiding principles, I cannot take into account the implications of land use decisions that have not been undertaken by government. As such, I accept that the analysis assumptions regarding these areas were appropriate, as no formal land use decisions have been made about the status of either area that would enable me to exclude the areas from contributing to timber supply. I encourage BCFS staff to continue to work with the appropriate stakeholders such that any resolution on land use status can be incorporated into the next analysis for the TSA.

First Nations considerations

Seven First Nations have asserted traditional territories in the Sunshine Coast TSA. Four of these First Nations—the Sechelt Indian Band, the Sliammon Indian Band, the Homalko Indian Band and the Klahoose Indian Band also have reserve lands within the TSA. The other three First Nations with asserted traditional territories within the TSA are the Squamish Nation, the Hamatla Treaty Society and the Xeni Gwet'in First Nations Government. Each of the First Nations who have an asserted traditional territory within the TSA are in the treaty negotiation process.

The Klahoose First Nation has historically prevented access into the Toba River valley. The majority of this area falls within TFL 10 but the Klite River drainage, a tributary of the Toba River, contains 622 hectares of timber harvesting land base within the TSA. District

staff believe that agreement may eventually be reached to allow some development in the area.

The Sechelt Indian Band recently rejected an Agreement in Principle (AIP) that covers 933 hectares of the timber harvesting land base of the TSA. A temporary order-in-council preventing activity within the area was due to expire at the end of November, 2001. However, recently a six month designation under Part 13 of the *Forest Act* was made for this area.

A provincial order-in-council was approved in August 2001 that designated an area identified in the Sliammon First Nation AIP. This order is in place until January 2002. The area is estimated to include 3736 hectares of timber harvesting land base. Harvesting in the area has been suspended by the Minister of Forests.

In the analysis, both of these areas, totalling 4669 hectares, were included as part of the timber harvesting land base.

I have considered the information about First Nations in the Sunshine Coast TSA, including the two areas designated under part 13 of the *Forest Act*. Under section 173 of the *Forest Act*, I may choose to temporarily reduce the AAC for an area designated in this manner. For the purposes of this determination under section 8 of the *Forest Act*, I make the following observations. First, the orders designating these areas are due to expire early in 2002, and it is not yet known whether the designations may be extended. In the 250 year timeframe used for timber supply forecast purposes, the implications of a such a temporary removal from the timber harvesting land base are negligible. Second, in the alternative harvest forecasts provided for the Sunshine Coast TSA, it was illustrated that the available timber supply was sufficiently large that the initial harvest level could have been as much as 9 percent greater than projected in the maximum even flow harvest forecast. On these accounts, I will not explicitly account for the exclusion of these two areas in this determination. I am satisfied that harvesting activity in these areas is operationally deferred until the appropriate status or management regime can be confirmed. Should I determine it to be warranted, I will make a temporary AAC reduction under part 173 of the *Forest Act*, separate and apart from this section 8 determination.

The Klahoose First Nation provided a submission in which it suggested that a further 5 percent reduction be made to accommodate reasonable interim measures for the Klahoose and other First Nations, with BCFS staff to meet with the Klahoose and other First Nations to determine the spatial location of protected lands. I note that, as mentioned under 'Guiding Principles for AAC Determinations', it is not within my jurisdiction under legislation to contemplate such a land base exclusion at this time.

With respect to the other areas in which harvesting operations are currently deferred, I note that no specific land use decisions have been made by government for the areas, and as a result it would be inappropriate for me to exclude these areas from contributing to timber supply in this determination. In any event, the areas involved are generally small and do not comprise a significant portion of the timber harvesting land base. If any land use decisions are made on the areas over the term of this determination, I will consider their implications at that time and I am hence prepared to revisit this determination sooner than would otherwise occur over the next five years. Alternatively, if in my judgement

accounting for these changes is not urgent, they can be factored into a future analysis for the Sunshine Coast TSA.

(b) the short and long term implications to British Columbia of alternative rates of timber harvesting from the area,

Alternative rates of harvest

The nature of the transition from harvesting old growth to harvesting second growth is a major consideration in determining AACs in many parts of the province. In the short term, the presence of large volumes of older forests often permits harvesting above long-term levels without jeopardizing the sustainability of future timber supply. In keeping with the objectives of good forest stewardship, AACs in British Columbia have been and continue to be determined to ensure that current and medium-term harvest levels will be compatible with a smooth transition toward the usually (but not always) lower long-term harvest level. Thus, timber supply should remain sufficiently stable so that there will be no inordinately adverse impacts on current or future generations. To achieve this, the AAC determined must not be so high as to cause later disruptive shortfalls in supply nor so low as to cause immediate social and economic impacts that are not required to maintain forest productivity and future harvest stability.

Several harvest forecasts would have been possible for the Sunshine Coast TSA, given the current management regime and assumptions made in the analysis. The assumptions for these options are discussed in detail in the *June 2001 Sunshine Coast Timber Supply Area Analysis Report.*

One alternative harvest forecast tested the maximum initial harvest level which could be attained without unacceptable future disruptions in timber supply. This alternative illustrated that an initial harvest level of 1 350 000 cubic metres per year could be maintained for 5 decades before declining to a long-term harvest level of 1 213 000 cubic metres per year. This initial harvest level is 9 percent above the level shown in the maximum even flow reference forecast, and the long-term level is 2 percent lower. This alternative harvest forecast provides me with an indication of the stability of the short- to mid-term timber supply for the TSA

As mentioned earlier in this document under Reference forecasts for the Sunshine Coast TSA, I have reviewed the alternative harvest forecasts provided, and I am satisfied that the harvest flow presented in the maximum even-flow harvest forecast provides the most suitable forecast of timber supply, and provides a suitable basis from which to evaluate the assumptions applied in the analysis.

Harvest profile

A relative oldest first harvest rule was assumed in the analysis, wherein the stands oldest relative to their minimum harvestable age were chosen first for harvest. However, an additional rule was applied in which a maximum of 40 percent of the harvest volume was permitted to be obtained from old growth stands (i.e., stands greater than 250 years of age), in order to reflect current practice of the harvest occurring in the mature second growth as well as old growth forests. The potential contribution of old growth stands to the harvest

forecast declined after 5 decades such that the maximum contribution was not met after this time.

I note that this constraint, which was applied in the analysis to modulate the flow of volume from old growth forests, likely caused harvesting to be somewhat more random than normally reflected by a relative oldest first harvest rule. Furthermore, BCFS staff advise me that the maximum 40 percent old growth constraint did not, in fact, affect the maximum even flow harvest forecast. Removal of the constraint changed the profile of stands harvested but did not alter the achievable harvest level.

On the basis of this information, I conclude that the constraint is somewhat artificial in that it controls that which likely already has been reflected in the analysis through the application of management constraints. However, for this determination, I am satisfied that the constraint applied in the analysis, while perhaps not required in order to accurately reflect current practice, had no significant implications for timber supply, and as such I make no adjustments on this account.

Community implications

A socio-economic analysis was conducted as part of the timber supply analysis, in which the impact of timber supply adjustments on local communities and the provincial economy was assessed. The assumptions and findings of the socio-economic analysis are presented within the June 2001 *Sunshine Coast TSA Timber Supply Analysis Report.*

Among the data presented in the socio-economic analysis is an assessment based on 1996 census data that the forestry sector contributes 28 percent to the total labour force. The forest sector contributes a total of 27 percent of the employment income in the TSA, ranging from 34 percent of the income in the Powell River area to 20 percent of the income in the Sechelt/Gibsons area. These values are exclusive of those public sector employees working in the forest sector, and were also reported prior to the recent shut down of the woodroom and kraft mill portions of the Norske Canada mill in Powell River.

Actual harvest levels in the Sunshine Coast TSA have been within 2 percent of the AAC in recent times. Between 1998 and 2000, an average annual harvest of 1 118 888 cubic metres supported approximately 508 direct person years within the TSA, and a further 792 direct person years elsewhere in the province. Indirectly, 315 person years within the TSA and a further 1340 person years province wide were also supported by that harvest level. The current AAC generates 32 to 36 million dollars in provincial government revenues, including stumpage, royalties, rent, industry taxes and income tax.

A significant amount of the public input received in response to the timber supply review related to socio-economic considerations.

Some of the public input questioned the emphasis of the socio-economic analysis on the forestry sector, noting the importance of tourism, fisheries, water quality, etc. Among other things, detailed information was requested on the following: the open-market value of wood and other products harvested; economic values calculated for other resource values such as scenic landscapes, natural habitat, old growth, fisheries, recreation, ecotourism; and, an assessment of the impacts of forestry activity on water treatment, community health and other concerns.

Other public input, received in the form of over 700 form letters, emphasized the importance of the forest industry as the major economic driver on the Sunshine Coast and protested any suggestions to stop logging activities. Some public input suggested that the employment figures underestimated the contribution of the forestry sector to the local economy.

I have considered all of the public input received during the timber supply review for the Sunshine Coast TSA. I am aware that there is a high level of contention among communities on the Sunshine Coast which to some extent reflects the diverse nature of the backgrounds and employment of the persons living here.

(c) the nature, production capabilities and timber requirements of established and proposed timber processing facilities,

Timber processing facilities

I have reviewed the information regarding timber processing facilities, and I am aware of the reliance of timber processing facilities on the volume harvested in the Sunshine Coast TSA.

(d) the economic and social objectives of the government, as expressed by the minister, for the area, for the general region and for British Columbia,

Minister's letter and memorandum

The Minister has expressed the economic and social objectives of the Crown for the province in two documents to the chief forester—a letter dated July 28, 1994, (attached as Appendix 3) and a memorandum dated February 26, 1996, (attached as Appendix 4). The letter and memorandum include objectives for forest stewardship, a stable timber supply, and allowance of time for communities to adjust to harvest-level changes in a managed transition from old-growth to second-growth forests, so as to provide for community stability.

The Minister stated in his letter of July 28, 1994, that "any decreases in allowable cut at this time should be no larger than are necessary to avoid compromising long-run sustainability." He placed particular emphasis on the importance of long-term community stability and the continued availability of good forest jobs. To this end he asked that the chief forester consider the potential impacts on timber supply of commercial thinning and harvesting in previously uneconomical areas. To encourage this the Minister suggested consideration of partitioned AACs.

The Minister's memorandum addressed the effects of visual resource management on timber supply. It asked that pre-Code constraints applied to timber supply in order to meet VQOs be re-examined when determining AACs in order to ensure they do not unreasonably restrict timber supply.

I have considered the contents of the letter and memorandum in my determination of an AAC for the Sunshine Coast TSA. As discussed under *deciduous forest types*, I am considering in this determination a partition to deciduous-leading stands, in part to ensure

that the volume contribution from these stands realized operationally is consistent with the contributions supporting the harvest level shown in the reference forecast.

As discussed under *visually sensitive areas*, a review of scenic areas was conducted in the Sunshine Coast TSA, and as a result of this review district staff have already implemented measures to optimise the timber harvest in the TSA consistent with good visual management and in accordance with this policy direction from the Minister of Forests. These measures were fully reflected in the reference forecast.

Local objectives

The Minister's letter of July 28, 1994, suggests that the chief forester should consider important social and economic objectives that may be derived from the public input in the timber supply review where these are consistent with government's broader objectives. The BCFS provided a number of opportunities for public input through the timber supply review process for the Sunshine Coast TSA, including opportunities to review the data package and the timber supply analysis and to respond to the public discussion paper. Numerous open houses and meetings were held to obtain feedback. In response, many submissions were received from regional district representatives, union representatives, licensees, First Nations, interest groups, and individuals. A summary of this public input is reproduced in full as Appendix 5.

I received a significant amount of public input in response to the timber supply review for the Sunshine Coast TSA, indicating to me that there is a high level of interest in the process. While I note that space limitations do not allow me to address much of the input in this document, I have attempted to respond to some input under the appropriate factors. As with all AAC determinations, regardless of whether the input is specifically discussed in this document, I have considered all of the public input received in my determination of an AAC. Some of the opinions expressed in the input relate to items outside my mandate to take into account as chief forester under my legislated authority for an AAC determination (section 8 of the *Forest Act).* For example, suggestions about allocation of timber harvesting rights are within the mandate of the Minister of Forests and not the Chief Forester. Opinions were expressed from various stakeholders recommending that the AAC be increased, maintained or decreased. While I acknowledge the opinions expressed, I note that any decision that I make on the harvest level for the TSA must be predicated on sound information, and I cannot speculate about land use or other decisions which have not been taken by government. As also mentioned elsewhere in this document, I am satisfied that the timber supply analysis provides me with a sound basis on which to assess the timber supply for the TSA.

As mentioned above, local objectives have been an important consideration in my determination of an AAC for the Sunshine Coast TSA.

(e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area.

Unsalvaged losses

I have reviewed the analysis assumptions about unsalvaged losses in the Sunshine Coast TSA, and I am satisfied that losses were appropriately accounted for in the reference harvest projections. As a result, I will not explicitly discuss my considerations in this rationale.

Reasons for Decision

In reaching my AAC determination for the Sunshine Coast TSA, I have considered all of the factors presented to me, and I have reasoned as follows.

Two reference forecasts were provided as part of the timber supply analysis. The first, a maximum even flow harvest forecast, projected that an initial harvest level of 1 233 000 cubic metres per year (about 8 percent above the level of the current AAC) could be maintained throughout the analysis timeframe. A second reference forecast indicated that the current AAC could also be maintained for this same time period while leading to an increase in available growing stock over time. As discussed under Reference Forecasts for the Sunshine Coast TSA, I accept that the maximum even flow reference forecast provides me with an assessment of the available timber supply, and is a good basis from which to assess the assumptions regarding land base, management practices and timber yields for this TSA.

Section 8 of the *Forest Act* requires me to consider a number of factors in the determination of an AAC for a timber supply area. In determining an AAC, my considerations identify factors which, when considered separately, indicate that the timber supply may actually be greater or less than that projected in the base case. Some factors can be quantified and their impacts assessed with some reliability. Others may influence timber supply by introducing an element of risk or uncertainty to the decision, but cannot be reliably quantified at the time of the determination.

I am satisfied that the assumptions applied in the maximum even flow reference harvest forecast for the majority of the factors applicable to the Sunshine Coast TSA were appropriate. Following is my consideration of those factors for which I consider it necessary in this determination to take into account implications to the timber supply projected in the base case.

Factors which indicate that the timber supply projected in the maximum even flow reference forecast may be overestimated, and to a degree that can be quantified to some extent, are as follows:

1) woodlot licences – I accept that as a result of additional volume issued to woodlot licences than was accounted for in the analysis, timber supply in the maximum even flow reference forecast has been overestimated by 9159 cubic metres, or approximately 0.7 percent. This factor affects timber supply across all time horizons;

2) *protected areas* – I accept that as a result of the designation of Malaspina Park through order-in-council since the analysis was completed, it is appropriate to take into account an additional exclusion of 461 hectares, or approximately 0.2 percent of the timber harvesting land base. This factor also acts across the entire analysis horizon;
3) *identified wildlife* – in order to account for the expected implementation of the IWMS, I will take into account that timber supply has been overestimated by 1 percent across the entire analysis timeframe;
4) *stand level biodiversity* – I accept that as a result of additional area reserved operationally in wildlife tree patches than was reflected in the analysis, timber supply may be overestimated by up to 2.2 percent;
5) *silvicultural systems* – I accept that as a result of the analysis assumptions that even-aged silvicultural systems are in use to a greater extent than current operational trends indicate, that site productivity will be lower than assumed in the analysis, and as a result timber supply has been overestimated by possibly 3 percent;

There are also some factors that indicate that the timber supply projected in the maximum even flow reference forecast may be overestimated, but to a degree that cannot be well quantified, as follows:

1) *marbled murrelet habitat* – in addition to the habitat provisions realized through the implementation of the IWMS, I expect that additional management considerations to address marbled murrelet habitat needs will act to further constrain timber supply, although the magnitude of this additional constraint is uncertain at this time;
2) *ungulate winter range* – it is possible that as a result of additional requirements for ungulate winter range, timber supply may be slightly more constrained than shown in the analysis;
3) *impediments to prompt regeneration* – as a result of concerns about hemlock looper and black bear damage in young stands, I accept that timber supply in the longer term has been overestimated by a small, but unquantified amount;

In addition to those factors which indicate that timber supply may be overestimated in the maximum even flow reference forecast, I have also identified a number of factors which indicate that the reference forecast likely underestimates timber supply, as follows:

1) *roads, trails and landings* – I am satisfied that past road rehabilitation efforts have resulted in an additional 500 hectares restored to productivity. The addition of this area, comprising about 0.2 percent of the timber harvesting land base, should be taken into account;
2) *site productivity* – I am satisfied that the productivity of second growth forests will be greater than indicated by data from existing old growth forests. The exact magnitude of this underestimation is uncertain, although it is may be as great as 7 percent. This influences timber supply across the analysis horizon;
3) *utilization standards* – as a result of a slight discrepancy between the standards assumed in the analysis and those practiced operationally, I accept that timber supply has been underestimated by approximately 0.4 percent in the mid term.

In consideration of the factors mentioned above, I have the following observations.

Of those factors indicating timber supply has been overestimated, only three—woodlots, protected areas and identified wildlife—can be precisely quantified. These factors additively indicate that timber supply in the maximum even flow reference forecast has been overestimated by 1.9 percent. Two other factors—wildlife tree patches, and the use of alternative silvicultural systems—indicate timber supply has been overestimated, but the influence of each on timber supply is somewhat less quantified, lying in an expected range of between 0 and 2.2 percent, and 0 and 3 percent, respectively. In consideration of these latter two factors, I believe it highly probably that an accounting for the additional retention expected in the use of alternative silvicultural systems will also account for the additional area retained in wildlife tree patches. The long-term timber supply implications resulting from the use of alternative silvicultural systems is not yet entirely quantified, but available information suggests an impact in the range of 3 percent. Therefore, I expect that the additive impact of those quantifiable factors acting to decrease timber supply is between 1.9 and 4.9 percent.

This brings us to the consideration of those factors indicating that timber supply as shown in the maximum even flow reference forecast was underestimated. The factor with the greatest potential impact on timber supply is site productivity. I believe that the site productivity for second growth stands is clearly underestimated for those sites currently occupied by stands older than 140 years of age. Sensitivity analysis results indicate that timber supply could be underestimated by up to 7 percent on this account. The other two factors— roads, trails and landings and utilization standards—have small influences which add to about 0.6 percent.

If one were to evaluate the interaction of these factors influencing timber supply, and one were to assume that the factors acting to decrease timber supply were at the highest end of the range and those acting to increase timber supply were at the lowest end of the range, then the cumulative impact indicates timber supply is about 4.3 percent less than shown in the maximum even flow harvest forecast.

I am also mindful that there are three additional factors indicating that timber supply has been overestimated, but these factors are not quantifiable at the present time. The implications of additional ungulate winter range management considerations, additional exclusions of timber harvesting land base in WHAs to support marbled murrelet habitat, and volume impacts resulting from damage by biotic agents are as yet uncertain. I am accounting in this determination for an additional 1 percent of the timber harvesting land base to be excluded under the implementation of the IWMS. However, in consideration of the high wildlife values present in the Sunshine Coast TSA, and in particular for marbled murrelet habitat, I am satisfied that timber supply will be further constrained than shown in the maximum even flow reference forecast on these accounts.

To assume that timber supply as shown in the maximum even flow reference forecast has been overestimated by 4.3 percent or a greater amount, as I discussed above, would be to assume that no site productivity adjustments are appropriate for the stands in the Sunshine Coast TSA, and I do not believe this to be the case. Second growth forests across the province are growing faster than indicated by the data from the existing old growth forests on these sites, and I have no reason to believe that this will not also be the case for the

stands in this TSA. As a result, it would be inappropriate to assume no site productivity increases will be apparent for second growth stands.

Having considered both the question of the site productivity underestimation, and the additional factors likely to decrease timber supply in the future, I am satisfied that the level by which site productivity has been underestimated is likely to more than offset the additional timber harvesting land base reductions likely to arise from provisions for marbled murrelet, grizzly bear and ungulate winter range. I am not placing any further weight on these combined factors at this time.

At this point in my reasoning, I have not yet accounted for, or placed weight on the new information identified under *regeneration* earlier in this document. In that section, I noted that hemlock-leading stands on between 17 and 20 percent of the timber harvesting are converted following harvest to Douglas-fir leading stands. As a result of disparity between the analysis assumptions around regeneration of these stands and current practice, timber supply was overestimated in the maximum even-flow reference forecast by between 1.6 and 1.9 percent.

Were it not for this factor, I would think it very reasonable to be contemplating an increase in harvest level for this TSA. However, this factor introduces a new range of uncertainty into this decision.

In consideration of the quantifiable factors acting to decrease timber supply, I note that the cumulative influence of these factors acts to decrease timber supply by about 6 percent from the level shown in the maximum even-flow reference forecast. In addition to these more quantifed factors, I am aware that there is still uncertainty about the future timber supply implications arising from the use of alternative silvicultural systems, the establishment of additional WHAs and ungulate range, and the presence of biotic agents in managed stands. In addition to these sources of uncertainty, I am mindful of the inherent uncertainty associated with the use of the Phase II VRI data in the analysis. Refinements in the data and the methodology through which it is applied could lead to timber supply being somewhat greater than forecast in the analysis in the mid to long term, but could also indicate timber supply is somewhat less than forecast.

In my view, these sources of uncertainty could act to further erode the potential of increased timber supply above the level of the current AAC that was forecasted to be available in the maximum even flow reference forecast. In addition, I am not prepared to increase the harvest level for this TSA in this determination, if information indicates to me that there is a possibility a decrease will be required in the future.

Overall, in consideration of the information discussed, I am satisfied that any timber supply above the current AAC reference forecast that may remain after accounting for these factors, given the bounds of uncertainty inherent in the analysis, does not represent sufficient cause to increase the AAC at this time. However, I believe that the additional 3000 cubic metres of volume from deciduous-leading stands that I am partitioning in this determination, while included in the reference forecasts, can be accommodated above the level of the current AAC in this TSA, given the available timber supply and the small magnitude of the partitioned volume.

The current AAC has an existing partition of 95 000 cubic metres for red alder-leading stands with at least 50 percent red alder by volume. Based on my considerations discussed

under *deciduous forest types*, I will also partition this same amount of volume in this determination to these stands.

In consideration of all of the information provided, I believe that an appropriate harvest level for the Sunshine Coast TSA in this determination is 1 143 000 cubic metres.

I hold the view that it may be possible to increase the harvest level in this TSA at some point in the future. In particular, I note that the harvest in the Sunshine Coast TSA is rapidly moving primarily into high productivity, second-growth forests. However, I will consider the potential for future increases only after such time as some of the uncertainty identified in this document around the data and analysis assumptions is further clarified.

Determination

I have considered and reviewed all the factors as documented above, including the risks and uncertainties of the information provided. It is my determination that a timber harvest level that accommodates objectives for all forest resources during the next five years, that reflects current management practices as well as the socio-economic objectives of the Crown, can be best achieved in the Sunshine Coast TSA by establishing an AAC of 1 143 000 cubic metres.

This harvest level includes a partition of 95 000 cubic metres per year to red alder-leading stands with at least 50 percent deciduous species by volume, and a further 3000 cubic metres per year to other deciduous-leading stands.

This AAC excludes all volume issued to woodlot licences since the 1996 determination.

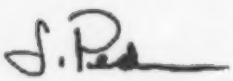
If additional significant new information is made available to me, or major changes occur in the management assumptions upon which I have predicated this decision, then I am prepared to revisit this determination sooner than the five years required by legislation.

Implementation

In the period following this decision and leading to the subsequent determination, I encourage BCFS staff to undertake the tasks and studies noted below that I have also mentioned in the appropriate sections of this rationale document. I recognize that the ability of staff to undertake these projects is dependent on available staff resource time and funding. These projects are, however, important to help reduce the risk and uncertainty associated with key factors that affect the timber supply in the Sunshine Coast TSA. I recommend that district staff:

- work with other agencies and stakeholders to establish those OGMAs and WHAs in the non-contributing land base, in order to reduce conflicts between meeting conservation objectives and operational planning;
- monitor harvesting performance in the partitions to red alder-leading stands and other deciduous-leading stands;
- work with the appropriate agencies to reduce the uncertainty in the VRI data and its application to the timber supply review;
- collect local site productivity data;

- refine the assumptions around species composition for the regenerating stands in the TSA;
- monitor regeneration damage due to black bear and looper;
- attempt to quantify concerns about alder ingress;
- monitor the use of alternative silvicultural systems, including the application of variable retention, over the term of this determination to assess (among other things) level of use and anticipated site productivity implications of this level of use;
- continue to establish UWR;
- continue to establish WHAs for marbled murrelet, grizzly and other species; and
- continue to monitor WTP retention and the interaction between this retention and the use of alternative silvicultural systems.



Larry Pedersen
Chief Forester
December 20 , 2001

Appendix 1: Section 8 of the *Forest Act*

Section 8 of the Forest Act, Revised Statutes of British Columbia 1996, reads as follows:

Allowable annual cut

8. (1) The chief forester must determine an allowable annual cut at least once every 5 years after the date of the last determination, for

(a) the Crown land in each timber supply area, excluding tree farm licence areas, community forest areas and woodlot licence areas, and

(b) each tree farm licence area.

(2) If the minister

(a) makes an order under section 7 (b) respecting a timber supply area, or

(b) amends or enters into a tree farm licence to accomplish the result set out under section 39 (1) (a) to (d),

the chief forester must make an allowable annual cut determination under subsection (1) for the timber supply area or tree farm licence area

(c) within 5 years after the order under paragraph (a) or the amendment or entering into under paragraph (b), and

(d) after the determination under paragraph (c), at least once every 5 years after the date of the last determination.

(3) If

(a) the allowable annual cut for the tree farm licence area is reduced under section 9 (3), and

(b) the chief forester subsequently determines, under subsection (1) of this section, the allowable annual cut for the tree farm licence area,

the chief forester must determine an allowable annual cut at least once every 5 years from the date the allowable annual cut under subsection (1) of this section is effective under section 9 (6).

(4) If the allowable annual cut for the tree farm licence area is reduced under section 9 (3), the chief forester is not required to make the determination under subsection (1) of this section at the times set out in subsection (1) or (2) (c) or (d), but must make that determination within one year after the chief forester determines that the holder is in compliance with section 9 (2).

(5) In determining an allowable annual cut under subsection (1) the chief forester may specify portions of the allowable annual cut attributable to

(a) different types of timber and terrain in different parts of Crown land within a timber supply area or tree farm licence area, and

(b) different types of timber and terrain in different parts of private land within a tree farm licence area.

(c) [Repealed 1999-10-1.]

(6) The regional manager or district manager must determine an allowable annual cut for each woodlot licence area, according to the licence.

(7) The regional manager or the regional manager's designate must determine a rate of timber harvesting for each community forest agreement area, in accordance with

(a) the community forest agreement, and

(b) any directions of the chief forester.

(8) In determining an allowable annual cut under subsection (1) the chief forester, despite anything to the contrary in an agreement listed in section 12, must consider

(a) the rate of timber production that may be sustained on the area, taking into account

(i) the composition of the forest and its expected rate of growth on the area,

(ii) the expected time that it will take the forest to become re-established on the area following denudation,

(iii) silvicultural treatments to be applied to the area,

(iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area,

(v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production, and

(vi) any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber,

(b) the short and long term implications to British Columbia of alternative rates of timber harvesting from the area,

(c) the nature, production capabilities and timber requirements of established and proposed timber processing facilities,

(d) the economic and social objectives of the government, as expressed by the minister, for the area, for the general region and for British Columbia, and

(e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area.

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Appendix 2: Section 4 of the *Ministry of Forests Act*

Section 4 of the *Ministry of Forests Act* (consolidated 1988) reads as follows:

Purposes and functions of ministry

4. The purposes and functions of the ministry are, under the direction of the minister, to

(a) encourage maximum productivity of the forest and range resources in British Columbia;

(b) manage, protect and conserve the forest and range resources of the government, having regard to the immediate and long term economic and social benefits they may confer on British Columbia;

(c) plan the use of the forest and range resources of the government, so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are coordinated and integrated, in consultation and cooperation with other ministries and agencies of the government and with the private sector;

(d) encourage a vigorous, efficient and world competitive timber processing industry in British Columbia; and

(e) assert the financial interest of the government in its forest and range resources in a systematic and equitable manner.

Documents attached:

Appendix 3: Minister of Forests' letter of July 28, 1994

Appendix 4: Minister of Forests' memo of February 26, 1996

Appendix 5: Summary of Public Input

File: 10100-01

JUL 28 1994

John Cuthbert
Chief Forester
Ministry of Forests
595 Pandora Avenue
Victoria, British Columbia
V8W 3E7

Dear John Cuthbert:

Re: Economic and Social Objectives of the Crown

The *Forest Act* gives you the clear responsibility for determining Allowable Annual Cuts, decisions with far-reaching implications for the province's economy. The *Forest Act* provides that you consider the social and economic objectives of the Crown, as expressed by me, in making these determinations. The purpose of this letter is to provide this information to you.

The social and economic objectives expressed below should be considered in conjunction with environmental considerations as reflected in the Forest Practices Code, which requires recognition and better protection of non-timber values such as biodiversity, wildlife and water quality.

The government's general social and economic objectives for the forest sector are made clear in the goals of the Forest Renewal Program. In relation to the Allowable Annual Cut determinations you must make, I would emphasize the particular importance the government attaches to the continued availability of good forest jobs and to the long-term stability of communities that rely on forests.

Through the Forest Renewal Plan, the government is taking the steps necessary to facilitate the transition to more value-based management in the forest and the forest sector. We feel that adjustment costs should be minimized wherever possible, and to this end, any decreases in allowable cut at this time should be no larger than are necessary to avoid compromising long-run sustainability.

.../2

Province of
British Columbia

Minister of
Forests

Parliament Buildings
Victoria, British Columbia
V8V 1X4

In addition to the provincial perspective, you should also consider important local social and economic objectives that may be derived from the public input on the Timber Supply Review discussion papers where these are consistent with the government's broader objectives.

Finally, I would note that improving economic conditions may make it possible to harvest timber which has typically not been used in the past. For example, use of wood from commercial thinnings and previously uneconomic areas may assist in maintaining harvests without violating forest practices constraints. I urge you to consider all available vehicles, such as partitioned cuts, which could provide the forest industry with the opportunity and incentive to demonstrate their ability to utilize such timber resources.

Yours truly,

Andrew Petter
Minister

Province of British Columbia
Ministry of Forests
OFFICE OF THE MINISTER

MEMORANDUM

File: 16290-01

February 26, 1996

To: Larry Pedersen
Chief Forester

From: The Honourable Andrew Petter
Minister of Forests

Re: The Crown's Economic And Social Objectives Regarding Visual Resources

Further to my letter of July 29, 1994, to your predecessor, wherein I expressed the economic and social objectives of the Crown in accordance with Section 7 of the *Forest Act*, I would like to elaborate upon these objectives as they relate to visual resources.

British Columbia's scenic landscapes are a part of its heritage and a resource base underlying much of its tourism industry. They also provide timber supplies that are of significant economic and social importance to forest industry dependent communities.

Accordingly, one of the Crown's objectives is to ensure an appropriate balance within timber supply areas and tree farm licence areas between protecting visual resources and minimizing the impact of such protection measures on timber supplies.

As you know, I have directed that the policy on management of scenic landscapes should be modified in light of the beneficial effects of the Forest Practices Code. In general, the new policy should ensure that establishment and administration of visual quality objectives is less restrictive on timber harvesting. This change is possible because alternative harvesting approaches as well as overall improvement in forest practices will result in reduced detrimental impacts on visually sensitive areas. Also, I anticipate that the Forest Practices Code will lead to a greater public awareness that forest harvesting is being conducted in a responsible, environmentally sound manner, and therefore to a decreased public reaction to its visible effects on the landscape. In relation to the Allowable Annual Cuts determinations that you make, please consider the effects that the new policy will have in each Timber Supply Area and Tree Farm Licence.

.../2

In keeping with my earlier letter, I would re-emphasize the Crown's objectives to ensure community stability and minimize adjustment costs as the forest sector moves to more value-based management. I believe that the appropriate balance between timber and visual resources will be achieved if decisions are made consistent with the ministry's February 1996 report *The Forest Practices Code: Timber Supply Analysis*.

Finally, in my previous letter I had asked that local economic and social objectives be considered. Please ensure that local views on the balance between timber and visual resources are taken into account within the context of government's broader objectives.

Andrew Petter
Minister of Forests

Sunshine Coast Timber Supply Area
Timber Supply Review

Summary of Public Input

BC Ministry of Forests
Sunshine Coast Forest District
7077 Duncan Street
Powell River, BC
V8A 1W1

December, 2001

This is a summary of the public input received on the Timber Supply Review in the Sunshine Coast Timber Supply Area. This summary does not assess the feasibility or validity of the input or whether it relates to the clearly defined mandate of the chief forester in the allowable annual cut determination.

Background

As part of the review of timber supply in the Sunshine Coast Timber Supply Area (TSA), two opportunities were provided for public input. The first followed release of the Sunshine Coast Timber Supply Area *Data Package* and *Information Report* in May 2000. The *Information Report* was a non-technical summary of the draft data and management assumptions that were to be applied in reviewing the timber supply for the Sunshine Coast TSA. A 30-day review period, ending June 19, 2000, was provided for the public to comment on these documents.

On June 14, 2001, the British Columbia Forest Service released the *2001 Sunshine Coast Timber Supply Area Analysis Report* and *Public Discussion Paper*. The public was encouraged to review and comment on the accuracy of the information in these documents and to provide additional information during the 60-day review period that ended August 13, 2001.

This report summarizes the input received during both public review periods. This information was provided to the chief forester for his consideration when he reviewed the AAC for the Sunshine Coast TSA. The first section of this summary outlines the public review process implemented by the Forest Service, and describes the types of public input received. The second section summarizes the public input in sufficient detail to indicate the range of input received. The original submissions (with personal identifiers removed in accordance with the *Freedom of Information and Protection of Privacy Act*) can be reviewed at the Sunshine Coast Forest District office.

Public Review Process and Response

Sunshine Coast District staff actively solicited public input on the Timber Supply Review in the Sunshine Coast TSA through the following actions:

- approximately 84 copies of the *Data Package* (and *Information Report*) and 125 copies of the *Analysis Report* (and *Public Discussion Paper*) were mailed to various stakeholders including interest groups, local government, forest licensees, businesses and First Nations within and adjacent to the Sunshine Coast TSA.
- meetings or presentations were offered, and the district developed a response form for the *Analysis Report* that readers were encouraged to complete and return.
- the *Data Package* and *Analysis Report* were available at the district office in Powell River, the field office in Sechelt and the regional office in Vancouver. About 40 copies of the *Data Package* and 120 copies of the *Analysis Report* were picked up.
- newspaper advertisements were placed, advising of the availability of all documents for review by the public.
- copies of all the documents were made available to the local media. Interviews were conducted with the local radio and newspaper.
- on June 1, 2000, a meeting was held in Sechelt with forest industry representatives. Ten people attended.
- on June 5, 2000, a meeting was held in Sechelt with representatives from local government and interest groups. Twelve people attended.

- in July and August, 2001, three open houses were held in Sechelt, Cortes Island and Powell River. Thirty-three people attended these events.
- referrals were made to the Ministry of Forests website where documents were available to download.

The Sunshine Coast Forest District received 19 written submissions on the *Data Package* and 36 submissions on the *Analysis Report* (see Appendix 1). As well, 740 form letters were submitted as public input on the *Data Package* and 218 form letters were received in response to the *Analysis Report*.

Public Input

In this section, public input on the information presented in the Timber Supply Review documents for the Sunshine Coast TSA is summarized under the following headings:

- Data Package (and Information Report)
- Timber Supply Area Analysis Report (and Public Discussion Paper)
- Other comments

Data Package

Land Base Factors

The Sunshine Coast Forest Coalition (the Forest Coalition) expresses a desire to see no further reductions to the size of the timber harvesting land base (THLB). The coalition says no further land withdrawals are required to meet provincial mandates for other resource values, noting that although only four percent of the TSA is under protected status, over 20 percent of this is protected within the THLB. The Forest Coalition says this exceeds the 12 percent mandate and the surplus eight percent should either be rolled back into the THLB or be used to meet landscape level biodiversity objectives.

Sladey Timber Ltd. says land withdrawals should not occur until they are official, referring to protected areas on Mt. Elphinstone and aboriginal land claims. The Sunshine Coast Species Survival Network (the Species Survival Network) maintains it would be prudent to remove the traditional territory of the Sechelt First Nation from the THLB since it may be unavailable for harvest. The network says it is disrespectful for the Crown to plan harvesting on land included in treaty negotiations, as this land does not legally belong to the Crown.

Two forest industry submissions express concern that land base reductions may overlap and be double- or triple-counted. They ask for a review of this.

Two submissions question the addition of formerly inoperable or marginal areas to the THLB. The following points are made:

- high elevation areas have severe regeneration problems and affect watershed dynamics during snowmelt events.
- the assumption that previously-logged low sites may be logged again because they were logged once is spurious and unsupported.
- if problem forest types are included, they must be partitioned.
- formerly excluded deciduous types and alder-leading stands must remain partitioned to ensure proposed practices are undertaken and to track if regeneration to coniferous actually occurs.
- the use of minimum stumpage charges to subsidize the harvest of marginal sites, in order to meet five-year cut control requirements, is not an acceptable practice or economically viable.

The Cortes Ecoforestry Society and the Klahoose First Nation say the operable land base needs to be significantly reduced due to declining forestry employment, the need to diversify the TSA's economy, unresolved treaties and the fact that land base reductions do not provide for the

maintenance of adequate ecological composition, structure and functioning. Examples are provided. These submissions note that the 20 percent of the TSA suitable for harvesting is also the area needed for other values such as fish and wildlife habitat, cultural values and eco-tourism.

Roads, Trails & Landings

Several forest industry submissions say the *Data Package* fails to account for roads that are rehabilitated and reforested, and suggest these areas should be returned to the THLB. The submissions provide data on road rehabilitation to support their position. Other comments include:

- future allowances for road rights-of-way should be reduced because of increased heli-logging.
- if existing roads are netted out directly from the land base, any roads within riparian reserve zones or in other withdrawn areas will be double-counted.
- the assumption that roads are non-productive when netted out is not necessarily true. E.g., Coast Mountain Hardwoods opens old roads to harvest alder.

Forest Inventory

The Species Survival Network says the forest inventory is not accurate enough to set an AAC. They recommend that resources be provided to complete an accurate inventory and that a sensitivity analysis be done regarding the level of scientific uncertainty about the age class inventory.

Expected Rate of Growth

Three forest industry submissions maintain that growth rates are being substantially underestimated, based on vegetation inventory work and on the fact that logged volumes nearly always exceed cutting plan volumes. The licensees provide data for a sample of cutblocks comparing cruise and scaled volumes, which show that productivity is underestimated. The Forest Coalition recommends a sensitivity analysis of this factor, while Interfor says the higher growth rates that have been confirmed should be included in the base case.

The Forest Coalition says that since improved seed has been proven to increase timber volumes and since it must be used when available, the potential to increase yields must also be recognized in the analysis. Licensees provide data on their use of improved seed. The Tuwanek Ratepayers Association say the long-term gains from improved planting stock is a "what-if" scenario, given the following:

- anticipated timber quality improvements may not occur, given long-term adaptation to a particular site.
- limited genetic variability may negatively affect the survival of forests, given climate change and pathogens.

Three submissions question the definition of the minimum harvestable age (MHA). They say the MHA does not maintain either timber volumes or value in the future, nor does it accommodate other forest uses and ecological functions.

Regeneration Delay

Two submissions say that using natural regeneration makes ecological and economic sense. They say short-term timber impacts from longer regeneration delays will be offset by cost savings from using natural regeneration and from restoration of long-term timber productivity.

The Forest Coalition provides licensee data to demonstrate that most licensees reforest within two years of harvesting and some achieve satisfactorily restocked status within 1.5 years. Interfor says they control about 50 percent of the AAC in the Sunshine Coast TSA and their records show an actual regeneration delay of 1.3 years.

Wildlife Management

The Roberts Creek Community Association says the Forest Practices Code's minimum standards for wildlife protection are now treated as maximum, and notes that portions of the Code that protect endangered species have never been enforced or fully implemented. The association says a complaint is currently before the Forest Practices Board regarding 150 blocks where critical habitat is being targeted.

A consultant refers to recent work that shows marbled murrelet populations continue to rapidly decline due to the destruction of breeding habitat in the remaining old growth forests. The consultant says the proposals for reserve areas are well below levels suggested by recent studies. The Tuwanek Ratepayers Association notes that federal policy requires area exclusions for the recovery of marbled murrelet populations.

The Tuwanek Ratepayers Association also says the exclusions for ungulate winter range do not address other wildlife habitat requirements or deer winter range needs, and even the reduction for critical goat range cannot be expected to be sufficient when the district has less than three percent protected area. Both goat and deer winter range should be mapped and specific areas excluded, according to the association.

The Species Survival Network's submission says they are pleased that new ungulate winter range maps are included and that critical goat winter range has been removed from the THLB. However, the network expresses concern that the *Data Package* contains no provisions for habitat needs for other wildlife and implies no current management for other species, which they say is not true. The *Data Package* should at the very least include maps of grizzly bear and marbled murrelet habitat, according to this submission.

Riparian Management

The Species Survival Network says the methodology used to calculate riparian areas has improved since the last Timber Supply Review (TSR1). However, the network suggests another approach (used in the Cranberry TSA), based on actual mapping and Code requirements rather than current practice as expressed by forest development plans.

Stand Level Biodiversity

Six submissions comment on the approach to stand level biodiversity in the *Data Package*. Their comments include:

- yield reductions are needed to reflect the designation of full cycle trees to provide a future source of large old trees, large snags and large deadfall, all of which are critical to stand level biodiversity.
- a minimum of 50 percent of natural levels of coarse woody debris is recommended by the *Biodiversity Guidebook*, a level that is unachievable under current utilization standards.
- the rationale for reducing Wildlife Tree Patches (WTPs) by 75 percent is absurd because much of the highest biodiversity areas and most important wildlife habitat are the same areas that are best for growing timber.
- reductions for WTPs must consider that in landscape units where extensive conversion to second growth has occurred, relatively more WTPs must be designated.
- scientific studies show that some critical wildlife species (e.g., pileated woodpeckers) require large ecologically intact areas to survive, and it's absurd to suggest that small WTPs or narrow riparian areas will ensure species survival.

Landscape Level Biodiversity

Two submissions question the use of the interim policy regarding low biodiversity emphasis option (BEO) areas and the two-thirds drawdown of old-growth requirements. The Sunshine Coast Conservation Association says this policy is not compatible with existing legislation, and policies that conflict with law cannot be accepted as current management. The Species Survival Network says if the interim policy is modelled,

the resulting AAC may preempt the possibility of full implementation of the guidelines when landscape unit plans are completed. Full implementation of biodiversity guidelines should be modelled, according to these submissions.

The Tuwanek Ratepayers Association expresses the opinion that Sunshine Coast communities will not likely accept low BEO and two-thirds drawdown for the Chapman landscape unit. The Sunshine Coast Regional District submission says that when landscape unit plans are completed, the biodiversity assumptions used in the timber supply analysis should be reviewed and the AAC adjusted.

A consultant says that if the level of remaining old growth has fallen below 10 percent of the original area in the TSA, then all harvesting must cease at the regional level. This submission suggests a goal of at least 12 percent of the land base, including productive forest areas, to be set aside to protect biodiversity.

Green-Up Requirements

Two submissions say a three-metre green-up height is insufficient to maintain adequate hydrological functioning. They say 15 to 20 metres is needed to provide the needle or leaf surface area and crown widths required for the interception of snow and rain, the protection of the forest floor and shading of snowpacks.

Watershed Management

The submission from the Sunshine Coast Regional District says they are opposed to logging in designated community watersheds or watershed reserves. A regional district director says decisions about activities in watersheds should be made by local governments, who are legally responsible for the quality and safety of the water flowing from them.

Two submissions say the Chapman-Gray Creek watershed should be removed from the THLB, citing the following reasons:

- a 1998 referendum made it clear residents do not approve of logging there.
- *de facto* protection is current management since the regional district took the Ministry of Forests to court in 1991 to stop logging due to the high frequency of landslides.
- current practice, indicated by Interfor's forest development plan, does not support its inclusion.

The Species Survival Network says all 26 of the designated community watersheds in the TSA should be removed from the THLB, as the costs of water filtration and/or increasing the distribution system are greater than any economic or social benefit to be gained from logging.

First Nations

The Species Survival Network says the information in the *Data Package* about archaeological/cultural sites is vague, and asks how it was developed and whether First Nations were consulted.

The Klahoose First Nation says they hold aboriginal title and rights throughout their territory, and they cite the Delgamuukw decision as confirming aboriginal title and rights and providing a framework for meaningful negotiations and consultation with First Nations. The Klahoose say co-management is a practical means of respecting their aboriginal title, and the Timber Supply Review could facilitate development of this by allocating a small portion of the operable land base to accommodate reasonable interim measures for Klahoose and other First Nations. The location of the lands to be protected would be decided by the Ministry of Forests and First Nations.

Socio-Economic Factors

The Forest Coalition says the forest industry is the major economic driver on the Sunshine Coast and even if tourism employment is higher, the annual income and taxation revenue from forestry is much greater.

The Forest Coalition also provides copies of 740 signed form letters, addressed to the Sunshine Coast Regional District, protesting the district's motion to stop all logging on the Sunshine Coast. The letters say that the forest industry is the major economic driver on the Coast and provides tax revenues that help run the regional district.

A consultant's submission says the *Data Package's* statement that forestry accounts for almost 30 percent of the total labour force implies this employment relies on wood from the TSA. The consultant says if wood from tree farm licences was excluded, a smaller employment level would result, noting also that most of the wood logged on the Sunshine Coast is not milled there.

The Sunshine Coast Conservation Association says the implications for the Crown's economic and social goals of not ensuring the protection of dependent, threatened and endangered species must be considered. The association says BC forest products have to meet increasingly stringent requirements to be accepted in the marketplace.

The Species Survival Network says the socio-economic analysis should:

- reflect that a lower harvest age will result in lower quality wood.
- include an estimate of the value of natural forest capital.
- include estimates of potential income from carbon trading credit programs, in which countries are paid to leave their forests standing.
- consider the value of using 10 percent post-consumer recycled pulp to allow a 10 percent reduction in the AAC.

A regional district director provides suggestions of additional types of data that must be integrated into the analysis. These include:

- for each local area, data on volumes of wood harvested, the value of them on the open market and royalties to the province.
- a comparison, area by area and licensee by licensee, between the free-market price and the values reported by licensees.
- ratios of estimated volumes of standing timber to volumes brought to the landing and to volumes arriving at mills.
- volumes and values of timber harvested from licensees' private lands.

An individual submission says victims of "downsizing" must be given access to alternate livelihoods (e.g., floral greens, medicinal herbs, beekeeping). This individual suggests balancing the annual take from a mushroom site against 80 to 100 years of waiting for the next timber harvest.

Timber Supply Area Analysis Report

Land Base Factors

The Forest Coalition, the Species Survival Network and an individual submission identify the need to define the Working Forest and avoid continual moving of the boundaries. The regional district submission says the part of Mt. Elphinstone recommended for park status should be removed from the THLB until issues of concern have been resolved.

A consultant says operability lines should be revised on the basis of future forest products and the ability to contribute to annual growth. The Sunshine Coast Conservation Association says subsidized heli-logging in inoperable areas highlights the fact that economically feasible, short-term timber supply is extremely limited in this TSA.

Two submissions point to an independent analysis of environmentally sensitive areas on Cortes Island that showed deficiencies in Ministry of Forests' estimates. The submissions say a revised analysis of bedrock terrain and

shallow soils is needed to define the operable land base and realistic growth rates.

Red Alder Types

Weyerhaeuser questions the assumption of a 40-year harvest of 95,000m^3 per year under the red alder forest licence. The company says a good proportion of alder-leading stands are already mature to overmature and won't be available for harvest much beyond the term of the present licence. They say operability in younger stands is more difficult, and their occurrence across the landscape is more limited than the current stands. The company requests mapping of the areas the *Analysis Report* assumes to be available, and expresses concern that the information in the report could be used to issue another hardwood licence that would compromise the viability of the current one.

Weyerhaeuser also says it's disconcerting they don't have full discretion to plant alder, and say the restriction on planting has already affected the long-term viability of the hardwood industry in this TSA. The company identifies many benefits of planting alder.

Forest Inventory

Four submissions comment on the status of the forest inventory. Their comments include:

- the degree of sampling uncertainty has been greatly reduced through use of the Vegetation Resources Inventory approach.
- an inventory is needed to account for the faster growth in second-growth stands. Any AAC increase attributed to this improved growth should only apply to those stands, to encourage licensees to intensify their silvicultural efforts.
- sufficient funding must be provided to complete forest inventory research.

Minimum Harvestable Age

The Sunshine Coast Conservation Association says reductions in MHAs since 1990 are another indication of uncertainty about short-term timber supply, as the reductions have produced the huge increase in "available" timber and an optimistic timber supply forecast. However, these reductions conflict with the maintenance of a balance of seral stages across the landscape, according to the association, which also notes that 95 percent of culmination age is meaningless in terms of ecological maturity.

Wildlife

Five submissions express concerns that provisions for wildlife habitat are insufficient. Specific concerns include the following:

- six years after implementation of the Forest Practices Code, the TSA still has no designated Wildlife Habitat Areas (WHAs) and only one completed landscape unit plan. Meantime, critical habitat is being fragmented.
- WHAs for grizzly bears have been mapped and should be removed from the THLB.
- the marbled murrelet has only 8.6 percent of its original habitat left. All suitable habitat that has been mapped needs to be netted out now, which will have a significant impact on the THLB since virtually none of the requirements can be met in the non-contributing forest. The marbled murrelet recovery team has called for setting aside of at least 10 percent of original old-growth forests; this TSA is in deficit.
- deer winter ranges and cover requirements to protect them must be accounted for in the analysis.
- no logging should occur in red- and blue-listed species habitats, or in potential Old Growth Management Areas.
- the assumption that wildlife will survive outside the THLB is flawed. Critical, low elevation habitat occurs extensively inside the THLB and is not well represented outside it.

- both the TSA and TFLs 43 and 39 do not have adequate mature forest cover constraints for wildlife, putting populations at risk throughout the forest district.
- Wildlife Tree Patches do not generally constitute suitable surrogates for WHAs because little if any high quality interior habitat is protected.
- the imperative to meet an inflated timber supply at the expense of wildlife habitat and biodiversity is the major forest policy conflict in BC, and this is epitomized in this TSA.

Biodiversity

Three submissions comment on how biodiversity provisions are accounted for in the analysis. These comments include:

- biodiversity should be increased before the AAC is.
- the assumption that the non-contributing land base and parks will adequately conserve biodiversity has no basis in ecology. Little of this area is low elevation.
- the two-thirds drawdown of old-growth requirements in low BEO units should not be considered because the area protected in parks is well below the provincial average of 12 percent and is not well dispersed.
- landscape unit planning as modeled is inadequate; timber supply policy simply overrides Code provisions for non-timber values. Examples are provided.
- the prediction in the analysis that old growth could contribute 500,000m^3 per year for the next three decades will require more land than the current 24,000 ha of old growth within the THLB (which provide one additional decade of harvesting at historical rates). This prediction also ignores old growth needed to meet minimal landscape unit planning requirements.
- after completion of landscape unit plans for the regional district portion of the TSA, the biodiversity guidelines used to set the AAC should be reviewed and the AAC adjusted if necessary.

Watersheds

Several submissions comment on the issue of community watersheds. Two submissions say all land within designated community watersheds and watershed reserves should be excluded from harvesting. The Regional District submission says water quality and quantity should be addressed as the first priority. As well, a regional district director says what the district wants is control of the watersheds upon which they rely. Two submissions criticize the inclusion of the Chapman/Gray Creek watershed in the THLB and the approval of logging there, saying these actions are provocative and confrontational, and designed to create "current practice" of logging in watersheds.

The Wilson Creek Watershed Coalition says the need for a Sensitive Habitat Inventory and a complete study of creeks in their watershed has not been considered in the analysis. The coalition wants a holistic approach to the entire watershed, including coordination of licensees, and asks when consultation with the group will occur.

Recreation Features

The Sunshine Coast Conservation Association notes the very small reduction to the THLB for recreation features, despite the 1990 *Options Report's* prediction of a significant increase in recreational usage and an inability to meet the expected demand.

Visual Quality

The Forest Coalition asks the Ministry of Forests to revisit Visual Quality Objectives (VQOs) because new harvesting techniques result in more volume available for harvesting.

Five submissions say the downgrading of VQOs in the TSA to allow maximum disturbance was accomplished in spite of broad local opposition by other economic sectors put at risk by this action. An individual notes that the forest industry did not keep their side of the bargain, continuing to downsize.

The Species Survival Network says VQOs should be restored to support the growing tourism and ecotourism industries, and to meet wildlife habitat needs. Two submissions note that many VQO zones are also coastal riparian zones and thus key habitats that need to be restored to a higher frequency of old-growth attributes over time.

The Regional District requests assurance that preservation of the visual integrity along popular travel corridors was considered in the analysis.

Socio-Economic Factors

The Forest Coalition says the analysis of employment associated with the forest industry is confusing and understated, noting that employment figures are incorrect and/or conflict with previous reports (i.e., *The Forest Industry in BC 1999*). An individual says that, unlike previous socio-economic analyses, this one shows the forest industry contributes about 30 percent of direct local employment, thus being a major contributor to the economic health of the community.

The Eco-care Conservancy of PR Region commented that the socio-economic analysis needed to account for other than just timber values. Examples were given, such as the value of botanical forest products and the value of the intact coastal forest. This submssion suggested the socio-economic analysis needed to be much more complex, and describe benefits and costs of different resource allocation decisions.

Nine submissions express concerns with various facets of the socio-economic analysis (SEA), including the following points:

- the need to protect all ancient forests for the survival of many small businesses that require wild places for their clientele must be considered.
- the economic consequences of boycotts of BC timber if wildlife habitat is not protected must be considered.
- the economic potential of the region derives as much from the natural amenities provided by intact natural habitat as it does from extractive industries.
- if the primary goal of harvesting is employment and income, other ways besides increasing the AAC and losing other forest values must be considered.
- much of the economic data is irrelevant. Sunshine Coast forests are fibre sources for industries on the Lower Mainland and Vancouver Island. Support for the local milling sector is largely limited to waste wood and problem types.
- the SEA is fundamentally inadequate as it does not considered the effect of harvesting on other economic sectors (tourism, the fishery), or the cost to all levels of government to remediate water quality.
- the SEA provides little for Sunshine Coast communities except some jobs in the harvesting, administration and silvicultural sectors; the cost (dedication of the entire productive forest land base exclusively for timber) is untenably high.

Other Comments

Most submissions comment on factors or issues other than those specifically covered by Timber Supply Review documents. These comments are summarized in this section.

Timber Supply Review Process

Many submissions comment on the Timber Supply Review (TSR) process itself. Comments include:

- the analysis is conservative in every input (e.g., growth rates, improved seed, road widths) with significant impact to timber supply.
- assumptions used in the analysis were sound and defensible. The *Analysis Report* is comprehensive and objective.
- far too little time was provided for review of the *Data Package*.
- providing preferential access to the process to stakeholders or members of special interest groups undermines the objective of full public review.
- the process is flawed due to the constraint that "current management practices" will be modeled. There is overwhelming evidence that higher standards are needed (in practice and in the analysis model). Recommend modeling an ecosystem-based approach as well.
- disagree that the TSR is not a process for making land use or management decisions. It is based on maintaining industrial sustained yield forestry as the dominant land use.
- if the best information available were used, current management practices would be rejected and better ones modeled.
- the potential for naturally sustainable forestry and the benefits of forest diversity are excluded, allowing only those species pleasing to the market to exist.
- if the chief forester does not recognize the risks to wildlife resources inherent in the current TSR assumptions and current policy direction, he may bring the independence of his office into question.
- the analysis is not ground-truthed or spatially defined. The AAC should be linked to landscape unit plans and forest development plans.
- TSR documents are the product of a radical myopia, as a result of basic unresolved contradictions in policy, intent and vision. Forest management continues to redesign primary forests for the flow of a narrow range of commodities, treating other values simply as "constraints" to timber extraction. Making the shift to precautionary adaptive management is the primary task of a legitimate TSR.
- the underlying TSR question should change from "what is the maximum amount of timber we can extract?" to "what is the level of growing stock we need biologically to maintain forest structure and function, regulate hydrology and provide for critical wildlife habitat?"
- a supplementary analysis is needed that focuses on the protection of critical and adequate wildlife habitat and encourages the kind of harvesting that leaves the fabric of the forest intact. Also needed is an economic analysis that recognizes the contribution of non-timber values.
- the *Analysis Report* refers to the need to consider "broader community and social aspects" which the directors of the Sunshine Coast Regional District are uniquely qualified to address. Yet, their input has been ignored.

- TSR provides an excellent snapshot of the old-growth liquidation plan if carried to its conclusion but does not provide a good basis for determining timber supply if sustainable forests and forest communities are the goal.

Harvest Levels

Seven submissions express support for an eight percent increase in the AAC, mainly to provide economic stimulus to the local economy and because the proposed level is sound and rational. One of these submissions says their support is conditional on the wood being processed locally, or at least in BC. Three of these submissions say the analysis supports the work done by the forest industry in TSR1 and therefore the eight percent increase should be applied retroactively back to 1993.

In addition, 218 form letters express support for an increase in the AAC to 1.233 million cubic metres. These letters, received from students, business people, retirees, the general public and forest industry employees and contractors, offer the following reasons for their support:

- it will help fuel the economy and provide much-needed revenues to the impoverished local community.
- the downturn in the local forest industry has resulted in increasing taxes, while the local employment picture just keeps getting bleaker.
- an increase will provide the catalyst to make the forest industry welcome in the local community, despite local and regional governments doing little to help residents enjoy a standard of living that comes on the heels of a viable local economy.
- the analysis is built on hard empirical data, and supports a healthy economy and healthy environment, and meets the needs of the local community.

Seventeen submissions do not support an increase in the harvest level, or advocate for a decrease. Their reasons include:

- biodiversity and wildlife are not adequately protected in the current analysis model. The collapse of ecosystems is becoming measurable.
- potential land base reductions (First Nations land claims, community forest tenures) are not allowed for.
- the current depressed lumber market.
- expanding urban recreation pressures.
- importance of visual quality.
- it's unlikely the economic benefits will be realized, given increasing mechanization and job losses, free trade agreements (re: log exports), etc.
- an increase will limit the planning of where and how to harvest.
- the impacts of global warming are not considered.
- the inclusion of community watersheds in the harvesting land base.
- it's preferable to wait until landscape level planning is complete.

Appendix 1

Submissions received by the Sunshine Coast Forest District

Submissions received on the Data Package

First Nations
Klahoose First Nation

Local government
Sunshine Coast Regional District
John Marian, regional director, SCRD
Gambier Island Local Trust Committee

Forest industry
Sladey Timber Ltd.
International Forest Products Ltd.
Sunshine Coast Forest Coalition – four submissions
Coast Mountain Hardwoods Inc.

Consultants
Paul H. Jones, forestry consultant

Interest groups
Cortes Ecoforestry Society
Tuwanek Ratepayers Association
Sunshine Coast Species Survival Network
Roberts Creek Community Association
Sunshine Coast Conservation Association

General public
Two individual submissions
740 form letters

Submissions received on the Timber Supply Analysis Report

Forest industry
Sunshine Coast Forest Coalition
Weyerhaeuser Stillwater Timberlands
International Forest Products Ltd.
Sladey Timber Ltd.
IWA Canada, Local 2171
Interfor
FAB Logging Co. Ltd.

Consultants
Anik Consulting
Bill Lasuta & Associates

Local government
Sunshine Coast Regional District
John Marian, regional director, Area B

Interest groups
Sunshine Coast Species Survival Network
Sunshine Coast Conservation Association
Cortes Ecoforestry Society
Friends of Caren
BC Environmental Network
Wilson Creek Watershed Coalition
Eco-Care Conservancy of PR Region

General public
Eighteen individual submissions
218 form letters